University of Alberta

Attitudes toward National Parks, the Environment, and Leisure: A Comparison between Chinese in Canada and Anglo-Canadians

by

Jinyang Deng ©

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ABSTRACT

Canada's population has become increasingly diversified. The People's Republic of China was the leading country of birth among individuals who immigrated to Canada in the 1990s, and Edmonton, Alberta's capital, has the fifth largest Chinese population in the country. Ethnic and racial diversity has important implications for evolving public policy involving the provision of leisure/recreation services, resource and land management, and environmental justice. Existing research has found various degrees of differences between majority and minority groups in leisure/recreation preference and behavior, and environmental concern. However, few studies involving Chinese immigrants and leisure/recreation have been conducted. The aim of this study was to examine the similarities and differences in attitudes toward national parks, the environment, and leisure between two ethnic groups--Chinese in Canada and Anglo-Canadians. Fourteen hypotheses were tested based on the data that were collected from a stratified systematic sample of 178 Chinese and 160 Anglo-Canadians who resided in Edmonton, Canada. Data were analyzed using factor analysis, multiple regression analysis, multivariate analysis of covariance, univariate analysis of covariance, and pairwise comparison. The results indicated that attitudes held by the Chinese toward the three areas were less positive overall than those held by Anglo-Canadians. Specifically, the Chinese, as compared to Anglo-Canadians, were less likely to support Parks Canada's policy of placing priority on the protection of ecological integrity, to endorse the non-market values of national parks and the New Environmental Paradigm (NEP). Moreover, their attitudes toward leisure were not as positive as those held by Anglo-Canadians. However, they placed more emphasis on social-altruistic values and were more likely to consider motorized activities and consumptive activities to be appropriate within national parks. While acknowledging these differences, both groups exhibited similarities in biospheric values, and attitudes toward national parks as places for the protection of ecological integrity and as places for provision of leisure/recreation opportunities. They also shared commonalities in attitudes toward the appropriateness of sport/recreation facilities and visitor facilities within Canada's national parks. Ethnicity was a more important factor than acculturation in influencing Chinese participants' attitudes about the three areas. Implications and future research needs are also discussed.

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Attitudes toward National Parks, the Environment, and Leisure: A Comparison between Chinese in Canada and Anglo-Canadians

CHAPTER ONE

INTRODUCTION

Canada has experienced a continuing decline in the number of people identifying themselves as being of British or French origin (Boyd & Vickers, 2000; Renaud & Badets, 1993). In contrast, the number of Asian immigrants began to increase during the 1980s, and increased substantially from 1991 onwards (Statistics Canada, 2003a). For instance, of the 1.8 million immigrants who arrived between 1991 and 2001, 58% came from Asia (Statistics Canada, 2003a). By 1996, Chinese immigrants became the largest visible minority not only among Asian groups, but also among all other immigrant groups in Canada (Chard & Renaud, 1999). This situation has persisted. In 2001, Chinese account for the largest visible minority group with a total of 1,029,395 individuals identifying themselves as being Chinese. These numbers represent 3.5% of the total national population and 26% of the visible minority population (Statistics Canada, 2003a). The People's Republic of China (mainland China) was the leading country of birth among individuals who immigrated to Canada in the 1990s (Statistics Canada, 2003a). By May 2001, a total number of 332,825 Chinese living in Canada were born in mainland China (Statistics Canada, 2003b).

With more immigrants arriving in the country, Canada's cultural mosaic is becoming increasingly evident. For instance, in 2001, Canada has more than 200 ethnic groups and the country is home to almost 4 million individuals who identified themselves as visible minorities, accounting for 13.4% of the total population (Statistics Canada, 2003a).

The increasing ethnic and racial diversity of Canada presents challenges and opportunities in every sphere of public policy including recreation provision (Chavez, 2000; Gramann & Allision, 1999), resource and land management, as well as environmental justice issues (McAvoy, Winter, Wilson Outley, McDonald, & Chavez, 2000). Previous studies have found varying degrees of difference between minority and majority groups in leisure preferences and recreation behavior, environmental decision-making, environmental concern, and cross-cultural land ethics (Caro & Ewert, 1995). However, the majority of these studies have focused on Whites and Blacks, or Hispanics. Very little research has been conducted on Asians in general or Chinese specifically in Canada, despite the fact that the Chinese community is the largest and fastest growing visible minority in Canada (Walker, Deng, & Dieser, 2001).

Moreover, the majority of previous studies have paid less attention to perceptions, values, and needs of subgroups within populations (Hutchinson, 1993, cited in Sasidharan, 2002). This is true despite the fact that "a heightened understanding of the values, attitudes and behaviors of the ethnic minorities … is important" in order for parks, forests, and related resources to be better managed (Sasidharan, 2002, p. 6). In view of the importance of studying people's values and attitudes toward issues relating to leisure/outdoor recreation, the environment, and resource use, and in consideration of the omission of these aspects in previous studies, the main purpose of this study will focus on examining the attitudes of two subgroups of Canada's population--Chinese in Canada and Anglo-Canadians--toward the three interrelated areas of national parks, the environment, and leisure.

One important research orientation involving race and ethnicity focuses on potential changes in values, attitudes, beliefs, or behaviors of a minority group as a result of acculturation. Unfortunately, one component of acculturation, that is, immigrants' interactions with their new physical environment, is often ignored, and "very little research [has examined] new immigrants' responses to various aspects of their new physical environment" (Ng, 1998, p. 64). Moreover, no previous studies have attempted to examine simultaneously the attitude change patterns of one minority group or its subgroups across the aforementioned three areas. Consequently, the purpose of this study is to redress this omission by examining similarities and differences between Chinese in Canada and Anglo-Canadians in terms of:

1. Attitudes toward the revised policy, roles and functions, and appropriate uses of Canada's national parks.
2. Attitudes toward the environment.
3. Attitudes toward leisure.

Ethnic groups, such as the Chinese in Canada, are not homogeneous (Li, 1998), and invariably demonstrate intra-group differences. For example, it is likely that Chinese from mainland China retain more traditional Chinese culture than the Chinese from Hong Kong, Singapore, and Taiwan which are more democratic and westernized than the former (Yu & Berryman, 1996). Therefore, Chinese immigrants from different countries or regions should be separately grouped and studied. In view of this, and taking into consideration that the majority of Chinese immigrants in Canada during the past ten years are from mainland China, the Chinese from mainland China will be chosen as the study group.

Attitudes: Definition, Formation and Change

As a result of this research centering on attitude comparison, a brief discussion of attitude definitions, formation, and change appears to be necessary and appropriate given that immigrants' shaped values, attitudes, and beliefs may change in their adopted country during the process of acculturation.

Defining Attitudes

Fishbein and Ajzen (1975, p. 6) defined attitude as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object." According to Rokeach (1973, p. 18), an attitude "refers to an organization of several beliefs that are all focused on a given object or situation" (cited in Uyeki & Holland, 2000). Attitude is considered one of the most important influences on behavior. Borden and Schettino (1979) contend that attitudes are composed of three components: cognitive, affective, and conative (or behavioral; cited in Newhouse, 1990). However, attitude is limited by most researchers to either the affective domain--as defined by Newhouse (1990, p. 26) as "an enduring positive or negative feeling about some person, object, or issue"--or to the cognitive domain, with beliefs, for example, being defined as "information that a person has about a person, object, or issue" (Petty & Cacioppo, 1981, cited in Newhouse, 1990, p. 26). In regard to the latter, for example, items in the New Environmental Paradigm (NEP; Dunlap & Van Liere, 1978) are intended to examine beliefs about humanity's ability to upset the balance-of-nature, to exceed the existence of limits to growth for human societies, and humanity's right to rule over the rest of nature (Dunlap, Van Liere, Mertig, & Jones, 2000). In contrast, however, the Leisure Attitude Scale developed by Ragheb and Beard (1982) does include all three dimensions of attitudes.

Attitudes and beliefs are difficult to disentangle. The relationship between values, beliefs, and attitudes is complex, and because these three elements are usually measured in attitude surveys, it is not easy to conceive of measuring attitudes apart from beliefs and values (Alwin & Scott, 1996).

Attitude Formation

According to Betancourt and Lopez (1997) and Rohner (1984), "the term culture refers to a learned system of beliefs about the manner in which people interact with their social and physical environment, shared among an identifiable segment of a population, and transmitted from one generation to the next" (cited in Schultz, Unipan, & Gamba, 2000, p. 23). It may be inferred that the particular value and belief systems of a given cultural group originate from a given social and physical environment. Thus, the attitudes and preferences of a group can be better understood when its cultural history and experience are examined in the context of its physical setting (Tuan, 1990). According to Uyeki and Holland (2000), "values and attitudes are learned by the individual as he or she is socialized into a particular status in the process of becoming an adult" (p. 648). This explanation is consistent with the interdependence theory, which proposes that long-term relationships play an essential role in shaping individual attitudes, beliefs, and dispositions (Siegenthaler & O'Dell, 2000). For example, Siegenthaler and O'Dell (2000) concluded that adolescents' leisure attitudes are formed through interactions with partners, parents, and siblings.

Attitude Change

Attitudes can be changed by various information inputs. "When others reinforce new attitudes, or when our values change, attitudes will also change" (Crandall & Slivken, 1980, p. 265). As acculturation is a process by which immigrants' formed values, attitudes and behaviors may change when interacted with the adopted society, an examination of acculturation's influence on attitudes could be very meaningful. For example, the adopted society such as Canada can function as a "ready-made 'experimental laboratory'… for the study of cultural acculturation and change" (Fried, 1958, cited in Yang, 1986, pp. 110-111).

Acculturation

A Chinese proverb goes, "one who stays near vermilion gets stained red, and one who stays near ink gets stained black" (*jinzhuzhechi, jinmozhehei*[1] 近朱者赤, 近墨者黑 [2]; *Note.* [1]The Hanyu pinyin system of romanization is used throughout this thesis if not otherwise specified. [2]Simplified Chinese characters are used throughout this thesis if not otherwise specified). Upon contact with a new culture, an individual may change in a number of ways. Berry (1980) proposed that this process of change involves six psychological areas: use of language, personality, identity factors, attitudes, learning styles, and levels of stress. During this process of cultural interaction, a newcomer would become acculturated or assimilated into the major society.

The classical definition of acculturation was proposed by Redfield, Linton, and Herskovits (1936, p. 149): "acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact with subsequent changes in the original culture patterns of either or both groups" (cited in Berry & Sam, 1997, p. 294). Acculturation involves the learning and adoption of the values and norms of the adopted society. Although acculturation will inevitably be experienced by all newcomers with the same cultural and ethnic backgrounds, the outcomes may vary. Berry (1980) proposed four basic strategies of acculturation: integration, assimilation, separation/segregation, and marginalization. Other studies found that most immigrants can be classified as integrated (see Goldmann, 1998; Korzenny, 1999) and separated, suggesting that "many immigrants actually desire to maintain a substantial part of their cultural heritage and identity in the society of settlement" (Berry & Sam, 1997, p. 305). This is the case for Chinese in Canada. For example, a large majority of Chinese having a single ethnic origin are integrated (74%), while 17.1% are separated/segregated, and only 8.4% are assimilated (Goldmann, 1998).

The above finding suggests that most immigrants are characterized by selective acculturation or functional acculturation, which "does not necessarily require individuals to disclaim their cultural values or disown their ethnic identities" (Duan & Vu, 2000, p. 226). In North America, according to Husbands and Idahosa (1995), it is very rare for a visible minority to be totally absorbed into the mainstream society. Whilst it is generally accepted that assimilation may happen to those who are second generation or at least "1.5 generation" as labelled by Rumbaut (1994; cited in Alba & Nee, 1997, p. 849), the Chinese seem to have much stronger ethnic retention. In terms of Chinese culture, Kriger and Kroes (1962) argued that even the second-generation Chinese Americans would very likely retain much of their cultural heritage (cited in Mah, 1995). This argument was supported by a number of findings. For instance, Rosenthal and Feldman (1992) found that second generation Chinese Americans as well as Chinese Australians still considered the importance of maintaining Chinese cultural practices in spite of their apparent shift of Chinese cultural norms in behaviors and knowledge. Moreover, they found that there are little differences in the measure of the cultural values in terms of individualism versus collectivism. Yang (1986) concluded, after comparing the motives of native Chinese and overseas Chinese using the Edwards Personal Preference Schedule (Edwards, 1959), that "we must say that this 'experiment' [as aforementioned] over many generations has been unable to change the overall need pattern of the Chinese 'subjects'"(pp. 110-111). The explanations for this could be twofold: one is traditional Chinese culture has long been deeply rooted in its members' personality and way of life (cited in Mah, 1995); the other is the greater cultural distance between China and North America. This pattern of acculturation of Chinese groups was evidenced in previous studies with respect to leisure patterns and nature (Allison & Geiger, 1993) and child rearing and education (Mah, 1995).

Some values and behaviors are shared by all peoples, regardless of cultural and ethnic differences, suggesting acculturation does not work or function on all aspects of human life. Consequently, it becomes meaningful when examining the relationship of acculturation to those cultural traits of a minority community that are distinct from those held by the adopted society. Kluckhohn and Strodtbeck (1961) classified cultural values into five dimensions: (a) man-nature orientation, (b) man-himself orientation, (c) relationship orientation, (d) past-time orientation, and (e) activity orientation. It is widely recognized and evidenced that man-nature value orientation and relational orientation (collectivism vs. individualism) are the most conspicuous dimensions between Chinese culture and Western culture. To examine the attitudes of Chinese in Canada with varied levels of acculturation toward the environment and national parks would be an appropriate approach to test and reflect how persistent or malleable these two cultural value orientations are as a result of acculturation. Another distinction in cultural traits between the two cultures is the work-leisure relationship, which falls within the activity orientation. For the purpose of this research, the impact of acculturation on these three cultural aspects will be examined.

Attitudes toward National Parks

National park agencies in North America and throughout the world are increasingly challenged to accommodate the dual mandates of protecting natural and cultural resources while providing positive recreation experiences for park visitors. This apparent dichotomy of purpose is viewed by many as the principal policy dilemma for park agencies (see Lowry, 1994; Rettie, 1995; Sellars, 1997). In many countries, including Canada, recent trends reflect a growing emphasis in both legislation and policy toward putting priority on reducing the threats to the ecological integrity of park environments.

This trend is clearly evident in Canada through the recommendations of the Ecological Integrity Panel, the new National Parks Act, proclaimed in February 2001, and the recent Parks Canada National Park management plans (see Dearden & Rollins, 2002). However, support for this stronger emphasis on protection is neither uniform nor unequivocal and many interest groups feel that the potential restrictions on tourism development and human use are unnecessary and unwarranted. As "resource uses and conflicts ultimately reflect society's values toward resources and the environment" (Jackson, 1987, p. 236), successful resolution of this debate requires an understanding of people's attitudes toward the evolving policy for national parks and their planning and management.

Although there is growing recognition of the need for a stronger social science preference in examining the role of national parks, "the strategic requirements for social science application as set out in the 1994 National Parks Policy have not yet been fully translated into practice" (Payne & Nilsen, 1997, p. 415). Furthermore, "research on the public acceptance and the effectiveness of various human use management strategies is lacking" (Parks Canada, 2001a, Current situation, para. 3) although "the use of surveys, public opinion polls, and the like can be very useful for documenting support or opposition for park management activities" (Rollins & Robinson, 2002, p. 137). As of yet, questions as to how the public perceives revised policy, functions and roles, and appropriate uses of national parks remain largely unanswered. More importantly, no previous studies have examined if minority groups--including Chinese in Canada--share a similar perception of national parks with the majority society.

Studies on people's attitudes toward the revised policy, roles and functions, and appropriate uses of national parks are particularly pertinent to issues relating to ecological integrity within national parks and other protected areas. According to the Ecological Integrity Panel (Parks Canada Agency, 2000a), consideration of the ecological integrity of parks requires an understanding of factors such as attitudes, values, beliefs, and behaviors of park visitors, regional communities, business, governments and park partners. In terms of appropriate uses, most of Canada's national parks are under increasing pressures to provide more and more visitor facilities such as trails, campgrounds, marinas, and downhill ski areas, to increase the level of overnight accommodation including hostels, motels, hotels, and luxury resorts, to accommodate more visitors, and to provide different types of visitor activities (Rollins & Robinson, 2002). However, "it is not possible to provide all types of visitor activities, services, and facilities" (Rollins & Robinson, 2002, p. 117) within a given national park as most of the threats to ecological integrity stem from human/visitor activities, especially the provision of visitor and tourism facilities (Rollins & Robinson, 2002; Swinnerton, 1999). For instance, wildlife movement could be affected by ski developments in parks, and accommodation can cause water pollution through sewage (Parks Canada Agency, 2000a). Therefore, an understanding as to what use is appropriate to national parks from the perspective of the public is helpful for decision making on "use without abuse" (Wright & Rollins, p. 211) of national parks. In terms of roles and functions of national parks, Rollins and Robinson (2002) argued that, in the face of increasing visitor demand on parks, "managers are challenged to articulate what purpose or role a park is to fulfill" (p. 118). Equally important is a need to know the roles and functions of national parks from the standpoint of the public. As the ultimate purpose of the revised policy is to fulfill the implementation of ecological integrity, factors that may undermine the fulfillment of this effort such as recreational overuse and overdevelopment, will be critically examined and addressed. Understandably, the new policy will affect the public use of national park as well as people's perception regarding the purpose and role of national parks. To this end, as a part of this study, attitudes toward the revised policy, roles and functions, and appropriate uses of national parks will be examined between the two groups.

The term national park may also mean different things in different countries (Phillips & Harrison, 1999). In mainland China, the term "national park" has not yet been officially adopted. Rather, national forest parks and other types of equivalents of national parks such as national scenic areas are more popular and acceptable among the public. According to 1997 United Nations List of Protected Areas prepared by World

Conservation Union (IUCN, 1998), in mainland China there are only 20 national parks that conform to the IUCN criteria, demonstrating a large variation in number as compared to the number of national forest parks (379 as of May 17, 2002, China news networks, 2002) or national scenic areas (151 as of July 29, 2002, "Scenic Areas", 2002). In addition, recreational activities in many of those areas are largely limited to sightseeing. The provision of specific facilities and infrastructures to support more active forms of recreation such as picnic and barbecue areas, golf courses, recreational vehicle areas, and camping sites is typical of most national parks in the world. Consequently, it may be assumed that Chinese from mainland China perceive national parks differently from their Anglo-Canadian counterparts. Based on this assumption, the following hypotheses will be examined in terms of the evolving priorities in national parks and their management.

H1: There exist significant differences in attitudes toward the revised policy of national parks between Chinese in Canada and Anglo-Canadians.

H2: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the revised policy of Canadian national parks.

H3: There exist significant differences in attitudes toward the roles and functions of national parks between Chinese in Canada and Anglo-Canadians.

H4: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the roles and functions of Canadian national parks.

H5: There exist significant differences in attitudes toward appropriate use of Canada's national parks between Chinese in Canada and Anglo-Canadians.

H6: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of appropriate use within Canadian national parks.

Attitudes toward the Environment

One of the most important issues confronting human beings, the species, and the planet is the severity of environmental deterioration and increasing encroachment on nature. Existing research has shown that ecological problems are largely ingrained with the traditional values, attitudes, and beliefs of the society, and positive attitudes and behaviors of individuals toward the environment and nature can contribute to amelioration of environmental problems (Newhouse, 1990; Palmer, 1998; Schahn & Holzer, 1990; R. Weigel & J. Weigel, 1978).

Although studies of environmental concern proliferate, much of the research reflects the opinions of the white majority (Jones, 1998). Other minorities such as Blacks, Mexicans, Hispanics, and Asians in North America have rarely been examined. Environmental concern of people of color needs to be examined in order that the opinions of different sectors of society can be reflected (Mohai, 1990; Uyeki & Holland, 2000). Asian groups are the least studied of all these groups. A review of the literature indicates that there are no existing studies that have undertaken a comparison of environmental concern between Chinese in Canada and Anglo-Canadians.

In the United States, Caro and Ewert (1995) suggested that environmental concern might be influenced to a greater degree by class and level of acculturation than by ethnicity. Schultz et al. (2000) also emphasized that, “culture plays an important role in determining attitudes about environmental issues” (p. 24). However, in the past two decades, little research has been conducted on either the relationship between culture and environmental attitudes (Schultz et al., 2000) or the role acculturation may play in terms of attitude change.

Environmental concern is closely related to two cultural values as identified by Chan (2001), namely man-nature orientation and relationship orientation. These two value orientations are historically and culturally distinct between Canada and China. As noted earlier, traditionally, Chinese hold a harmonious man-nature worldview while North Americans hold a worldview of man-domination-over nature. Consequently, it may be assumed that Chinese are more likely to be concerned about the environment than are Canadians. The same assumption may also be derived from the relationship value orientation that individualistic Anglo-Canadians tend to care less about the environment than do collectivistic Chinese in Canada. However, this assumption may be overly simplistic. Furthermore, the world and globalization are dynamic, and traditional values and attitudes are also changing. For instance, the traditional Chinese man-nature view began changing in mainland China in the 1980s due to the pursuit of economic development (Wu, 1999), while in the same period, the traditional Western world's view was also changing as illustrated by changes reported in the NEP. Wang and Stringer (2000) argued that, "while nature is highly valued by many Chinese, China has not, to date, been an environmentally conscious country" (p. 38). Thus, the following questions will be posed: (a) do Chinese in Canada still hold traditional Chinese cultural values, and do these values affect their environmental attitudes?; (b) does the process of acculturation vary among the Chinese?; and (c) how does acculturation affect Chinese-Canadians' attitudes toward the environment? Based on the above, five specific hypotheses will be examined in this section:

H7: There exist significant differences in environmental values between Chinese in Canada and Anglo-Canadians.

H8: The more acculturated Chinese are, the more similar their environmental values will be to those of Anglo-Canadians.

H9: The less acculturated a Chinese, the higher retention of his or her traditional values.

H10: There exist significant differences in attitudes toward the environment between Chinese in Canada and Anglo-Canadians.

H11: The more acculturated Chinese are, the more likely their environmental attitudes will be similar to those of Anglo-Canadians.

Attitudes toward Leisure

Neulinger and Breit (1969) identified leisure attitudes as one of four approaches to leisure research. The other three, as listed by Meyersohn (1969), are: (a) activities, (b) expenditures of time and money, and (c) meanings (in Neulinger & Breit, 1969). However, studies on leisure have usually either focused on leisure behaviors or leisure motivations, satisfactions and meanings, and have largely ignored leisure attitudes (Crandall & Slivken, 1980). This situation has remained unchanged over the last two decades.

The relatively limited attention paid by social scientists to leisure attitudes does not mean this direction of research is not worthwhile. Rather, "since one of the definitions of leisure is a state of mind, attitude can be more important than behaviors" (Chesnutt, 1980,

p. 957), and “attitudes are a good way to estimate people’s mental reactions to leisure” (Crandall & Slivken, 1980, p. 261). Previous studies found that leisure attitude is the source of leisure motivation (Ragheb & Tate, 1993), and is positively related to leisure participation and satisfaction (Ragheb, 1980; Ragheb & Tate, 1993). Hence, “understanding leisure attitudes are of prime importance” (Chesnutt, 1980, p. 757).

Leisure studies involving race and ethnicity have also focused on the interpretation of the differences and similarities of leisure patterns (i.e. participation rates and activity variations) and leisure styles (i.e. motivations, preferences, and on-site behaviors) within or between minority and the majority groups. Few studies have examined the underlying attitudes toward leisure among ethnic groups including Chinese. Obviously, without an informed understanding of attitudes toward leisure, leisure behaviors of ethnic groups cannot be fully appreciated.

As leisure may be interpreted differently among different ethnic groups, research on understanding leisure attitudes held by a minority group should be a priority for researchers. Probably, it is more meaningful to investigate what people are thinking rather than what they are actually doing. Before any examination of leisure patterns or styles, we need first to ask as to how people with diverse cultural backgrounds perceive the role and importance of leisure, and what they think about leisure. However, “there has not been any substantial research in this direction” (Husbands & Idahosa, 1995, p. 94), and “not many large-scale or cross-cultural studies seem to exist in which leisure is addressed” (Langenhove, 1992, p. 150). This omission is specifically true for leisure attitude comparison between China and North America. In recognition of this research gap, Wang and Stringer (2000) proposed that, “…it is important for the global community to continue to identify both the similarities and differences in the understanding and practice of leisure between North America and China" (p. 40).

"The idea of leisure itself has typically been less recognized in China than in North America" (Wang & Stringer, 2000, p. 35). The dimensions of leisure as defined in North America and other Western countries "often do not hold when applied to Chinese culture and experiences" (Wang & Stringer, 2000, p. 35). Most Chinese have not identified the role and importance of leisure. For example, there are currently no universities or colleges or research institutes in China where individuals can pursue an education or undertake research in the study of leisure (except sports and tourism, specifically; Wang, 1999). Even in Hong Kong, which is more westernized and modernized than mainland China, currently, "none of the local major universities offer leisure or recreation programmes" (Ap, 2002, p. 12).

It is likely that attitudes of Chinese about leisure are different from those of Canadians. Hall and Rhyne (1989) found that Chinese, together with three other visible minority groups (South Asians, West Indians, and Portuguese) displayed what has been referred to as a "leisure lack" (p. 19). These four groups "participated in fewer activities, expressed less satisfaction with their leisure, and even placed a lesser value on leisure" (cited in Husbands & Idahosa, 1995, p. 91).

Since the formation of leisure attitudes is influenced by social/situational environment or personal past experiences (Zoerink, 1988), adult immigrants, including Chinese coming to a new country such as Canada bring with them established leisure attitudes that are distinct from those held by Canadians. However, these leisure attitudes may change due to the process of acculturation. Stodolska (2000) argued that "there has been no systematic effort to address the issue of immigration-induced changes in leisure"

(p. 40), including changes of leisure attitudes. Based on the above, three hypotheses will be examined:

H12: There exist significant differences in leisure attitudes between Chinese in Canada and Anglo-Canadians.

H13: The greater level of acculturation a Chinese person has, the more likely his or her leisure attitudes will be similar to those of Anglo-Canadians.

H14: Leisure attitudes held by Anglo-Canadians are more positively valued than is the case of Chinese in Canada.

CHAPTER TWO

LITERATURE REVIEW

In order to provide a rationale and context for the questions and hypotheses identified in the previous section, a review of the relevant literature on attitudes toward national parks, the environment, and leisure is necessary.

National Parks

This review of the literature on national parks comprises four sections. The initial section provides an overview of the evolution of policy and legislation relevant to preservation and visitor use within national parks in the United States, and specifically Canada. This overview is followed by a summary of the reactions of stakeholders or vested interest groups to changes in national park policy and legislation with an emphasis on Canada. A third section presents a brief comparison of protected areas in Canada and China. Finally, people's attitudes toward national parks in general, and appropriate uses specifically within these areas are discussed by reference to the findings of relevant empirical studies.

Any examination of people's changing attitudes toward national parks must acknowledge that the legislative and policy context within which these protected areas have been established and subsequently managed are constantly evolving. Parks policy and legislation are frequently reflective of the balancing of political experience and scientific expertise (see Freemuth, 1989). Increasingly, national park policy within individual countries is often reflective of changing attitudes toward protected areas at the global level. Moreover, public policy invariably reflects and responds to an amalgam of the prevailing beliefs, values, and norms of a society at a particular point in time (see Clark, Willard, & Cromley, 2000). Since the first national park, Yellowstone, was established in 1872, there have been important developments in legislation and policy that have resulted in changes in the management of the park environment and the provision of recreation opportunities for park visitors. Consequently, an initial phase in considering the place of national parks in this study is an overview of the more significant developments in legislation and policy.

National Park agencies around the world are experiencing increasing difficulty in balancing their dual mandates of protecting park environments while at the same time providing opportunities for public enjoyment and recreation. Historically, these two mandates were seen as being essentially compatible. Consequently, there was no requirement to provide guidance through either legislation or policy as to which of these two mandates should be given priority. This situation is no longer the case. Over the last quarter century there has been a shift amongst park agencies to place greater emphasis on the protection role of national parks and equivalent reserves. The stimulus for this shift has been twofold. In the first instance, there has been demonstrable evidence that the increasing numbers of visitors to many parks, the growing diversity of recreation opportunities being sought, and the attendant infrastructure, are putting increasing stress on the ecological integrity of many park environments. At the same time, and with the escalating anxiety about the vulnerability of the earth's biodiversity, it has become increasingly evident that national parks and other protected areas have a central role to play in protecting this biological diversity. Consequently, the protection and restoration of the ecological health of these areas is seen as being of both national and global significance (see Swinnerton, 1999, 2002).

Indicative of this growing emphasis on protection are some of the changes that have been taking place in countries such as the United States and Canada. Formal and legislated responsibility for the protection-use dilemma that characterizes many of the world's national parks can be accredited to the US *National Park Service Organic Act* of 1916, on account of the fact that many countries adopted this paradoxical mandate (see Swinnerton, 1989). The subsequent history of national parks in the United States reflects a tenuous relationship between the intended coexistence of protection and public enjoyment. However, evidence of the growing appreciation for strengthening the protection role of national parks is provided in the *Management Policies 2001* (National Parks Service, 2000, p. 28) that specify that, "in cases of doubt as to the impacts of activities on park natural resources, the Service will decide in favor of protecting the natural resources."

Canada's initial National Parks Act in 1930 followed the precedent set by the United Sates, and consequently the dilemma of balancing protection and use became entrenched in legislation and policy in this country also. Section 4 of the 1930 Act stated:

> The Parks are hereby dedicated to the people of Canada for their benefit, education and enjoyment, subject to the provisions of this Act and the Regulations, and such Parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations.

Even after the passing of the 1930 Act, Parks Canada frequently assumed the role of an entrepreneur, but by the mid 1960s many Canadians were beginning to question the appropriateness of developments such as ski areas and golf courses.

In response to these concerns, a new *National Parks Policy* (National and Historic Sites Branch Indian and Northern Affairs, 1969) acknowledged the difficulty in dealing with the dual mandates by noting that, "… administrators have never had the benefit of a clearly defined park purpose to guide them" (p. 4). Although it was recognized that increased visitor numbers would result in growing impacts on the park environment, no explicit direction was given in the Policy as to which of the two parks' mandates, preservation or the provision of public enjoyment, would take priority.

Clarification at a policy level was eventually provided in the *Parks Canada Policy* document of 1979 (Parks Canada, 1979). This Policy indicated that Parks Canada would assign primary consideration to the protection of heritage resources. Legislative enforcement for this new policy direction was enshrined in Bill C-30, an Act that amended the *National Parks Act* and came into force on September 16, 1988. The need for this priority was vindicated by the findings included in the first *State of the Parks 1990 Report* (Canadian Parks Service, 1991) that recognized the impact of both internal and external threats to the conditions of park resources. Overuse by park visitors was recognized as one of the significant internal pressures on national park environments. Three years later, Parks Canada's *Guiding principles and operational policies* (Canadian Heritage, 1994) specifically stated that the paramount guiding principle was ensuring ecological and commemorative integrity. To this end, science based ecosystem management was promoted as the means by which the natural environments of the parks would be protected.

Notwithstanding these changes in policy and legislation that placed increasing priority on protecting ecological integrity, there continued to be inconsistent application of the *National Parks Act* and Parks Canada's Policy (Swinnerton, 2002). This perspective was one of the key conclusions reached by the Banff-Bow Valley Task Force (Banff-Bow Valley Study, 1996). One of the other conclusions that the Task Force came to, and which is particularly relevant to the present study that is examining people's attitudes to national parks, was that "a significant percentage of the population find it difficult, based on what they see around them, to understand the ecological impacts that have occurred" (Banff-Bow Valley Study, 1996, p. 11).

In addition to the findings of the Banff-Bow Valley Task Force, the State of the Parks reports have consistently recorded the negative impact of stressors on the ecological integrity on virtually all of Canada's National Parks (see Parks Canada, 1995; 1998). More recently, the Panel on the Ecological Integrity of Canada's National Parks confirmed that the ecological integrity of virtually all of Canada's national parks were being threatened by a multiplicity of both internal and external stressors (see Parks Canada Agency, 2000c). To address this problem, the Panel explicitly stated that ecological integrity must be placed at the core of Parks Canada's mandate. A corollary to this priority was to be the adoption of principles for human use management involving standards that use ecological integrity as a determining factor, and the reduction of the human footprint within national parks (see also Parks Canada, 1994, 1999).

Three weeks prior to the release of the report of the Ecological Integrity Panel, the Minister of Canadian Heritage had on March 1, 2000 tabled the Canada National Parks Bill. The *Canada National Parks Act* was assented to on October 20, 2000. Section 4.(1) of the Act reiterates the dual mandate of national parks, as was the case in the original National Parks Act of 1930. However, under the administration section of the new Act: Section 8(2), the priority that is to be assigned to ecological integrity is unequivocally confirmed and is more encompassing than the corresponding legislation contained in the

1988 amendments to the Act. The new *Canada National Park Act* became law on February 19, 2001.

Alternative Reactions and Opinions to Changes in Policy and Legislation

Not surprisingly, the duality of purpose that has been inherent in national park policy and legislation has provided fertile ground for debate and not infrequently litigation between the respective interests. An overview of these conflicting positions provides an appropriate prerequisite to considering the perspectives and attitudes of the general public and visitors regarding the role of national parks and the types of activities that should take place within such settings.

For the most part, environmentalists and natural scientists are highly supportive of this trend and have often expressed the view that assigning priority to preservation is long over due and that there needs to be more demonstrable action on the ground (see Swinnerton, 1999, 2002). In the case of the United States, Frome (1992) has warned against the increasing tendency to treat parks as commodities, and has advocated a "regreening" of national parks and their reinstatement as models of ecological harmony (see also Lime, 1996; Lowry, 1994; Sellars, 1997; Zube, 1996) and the promotion of those "contemplative" forms of outdoor activities that have a much greater likelihood of leaving the parks unimpaired (Smith, Rexford & Long, 2001; see also National Parks Conservation Association, n.d.).

However, opposition to greater protection within the national parks has a long history (see Lowry, 1994). In the 1980s, Hummel (1987) argued that the US National Parks Service had been anti-democratic in its adoption of exclusionary policies whereby public access was denied and private concessions were terminated. More recently, Smith et al. (2001) have commented on the well-financed lobbying machinery that is representing the thrill-craft industry and the users of their products in an attempt to block and repeal any moves to restrict their use within national parks and other protected areas.

The debate over the need to protect the ecological integrity of national parks has been equally intense in Canada (see Dearden, 2000; Gailus, 2001; Searle, 2000; Swinnerton, 1998, 2002). In many ways, it was the failure of Parks Canada to deal with the conflicting aspirations of environmental groups and the business community that led to the establishment of the independent Banff-Bow Valley Task Force in 1994 (Banff-Bow Valley Study, 1996). Moreover, following the fact-finding visit to Banff National Park in October 1994, the Senate of Canada's Standing Committee on Energy, the Environment and Natural Resources commented that it had, "…heard first hand how the desires of local businesses and conservation interests are on a collision course. Each has a very different view of the role of national parks" (Senate Committee of Canada, 1996, p. 39). Environmental groups, such as the Canadian Parks and Wilderness Society (CPAWS) and the Banff-Bow Valley Naturalists have been critical of Parks Canada when they perceived that practice was not conforming to policy and legislation (see Gailus, 2001; Searle, 2000; Swinnerton, 2002; Urquhart, 1998). An on-going issue in these debates has been the types of recreation that are appropriate within national parks. In the case of Banff National Park, CPAWS, the Banff-Bow Valley Naturalists, and other environmental groups are of the opinion that industrial tourism and attracting the international convention market is an inappropriate role for national parks (see Corbett, 1998). Not surprisingly therefore, the priority assigned to protecting ecological integrity as evidenced in recent national parks policy, the recommendations of the Ecological

Integrity Panel and the new *Canada National Parks Act* received enthusiastic support from environmental groups (see CPAWS, 2000).

Advocates for developing the tourism and recreation potential of Canada's national parks have been an integral part of the history of these protected areas (see Bella, 1987). Despite the growing evidence that the ecological health of most of Canada's national parks are being compromised (see Banff-Bow Valley Study, 1996; Canadian Parks Service, 1991; Green, Pacas, Cornwall & Bayley, 1996; Parks Canada Agency, 2000c, 2000d), advocates for public enjoyment and tourism within the national parks continue to be skeptical about the magnitude of the problem and feel that many of the restrictions on development and human use are unnecessary and unwarranted (see Association for Mountain Parks Protection and Enjoyment (AMPPE) 1999, 2000; Corbett, 1998; Gailus, 2001, Searle, 2000; Sillars, 1996; Swinnerton, 2002; Urquahart, 1998). Not surprisingly, hostile reaction to the priority being given to preservation within national parks has been most evident in the case of the Mountain Parks and specifically Banff (see AMPPE, 1999). Similar reactions that focused on the unfair curtailment of the human use and enjoyment of the parks, were submitted by AMPPE (2000) to the House of Commons Standing Committee on Canadian Heritage regarding the new national parks (Bill C-27). Parks Canada's intent to reinstate the ecological integrity of Canada's National Parks has also been criticized by the Fraser Institute in its report, *Off limits: How radical environmentalists are shutting down Canada's National Parks* (LeRoy & Cooper, 2000).

Both the Parks Canada Agency and the Minister of Canadian Heritage are conscious of the need to gain the support of the people of Canada if the protection of Canada's National Parks is to be successful (see Parks Canada, 2000). In its handbook *Spectrum of* *appropriate national park opportunities* (Nilsen & Taylor, 1999), Parks Canada states that:

> Managers of the National Parks System must understand not only the ecological systems, the cultural resources and the values associated with heritage landscapes, but the perceptions, expectations and benefits sought by the public, and, more precisely, the expectations and benefits sought by those who want to use the opportunities that Parks Canada can provide. (p. v)

An important dimension of this process is for the Parks Canada Agency to have a coherent and consistent message in terms of what the Agency is and what the organization is mandated to do. Equally important is the need to convey this message in an effective and efficient way to the people of Canada and international visitors. To achieve these goals, Parks Canada (2001b) has produced an external communications strategy. The purpose and goals section of the Strategy states that:

> Canadians value national parks, national historic sites and national marine conservation areas of Canada. The more Canadians know about them and appreciate their resources and the issues and challenges they face, the more likely Canadians are to appreciate these heritage places and support the work required to assure their preservation and protection. Engaging Canadians will enable Parks Canada to deliver its priority messages to target audiences in the most effective and efficient manner. (p. 3)

The Strategy also acknowledges that this task has a particular urgency with the increasing number of special interest groups and Canada's increasingly diverse population. An underlying principle to the approach adopted is that effective communication reflects a continuum that progresses from awareness to knowledge and understanding, and finally to support. In addition, one of the stated objective of the Agency communication framework is: "to cultivate understanding and support for Parks Canada's efforts in ensuring ecological and commemorative integrity in the management of national parks, national historic sites and national marine conservation areas" (p. 10).

National Parks in Canada and China

Prior to examining the literature on the attitudes of visitors and the general public towards national parks, it is important to recognize some of the distinctive characteristics of national parks in Canada and China. The designation of protected areas as national parks within individual countries disguises the fact these areas may operate under legislation and policies that are very different in terms of the priority assigned to preservation and public enjoyment, the types of activities that are permitted within the parks, and the overall approach to park management (see Bella, 1986; IUCN, 1994; Lowry, 1994). Recognition of such differences is critical to the present study because there is a strong likelihood that Chinese immigrants to Canada, and particularly the more recent ones, will use their knowledge of national parks and protected areas within their country as a reference point for considering the role and appropriate use of national parks in Canada.

Although virtually every country in the world has protected areas, the objectives and management of these areas vary considerably. Moreover, the title of "national park" is just one type of protected areas (see Phillips & Harrison, 1999). Over the past forty years there has gradually evolved an internationally accepted definition of a "protected area" and the adoption of a classification system of management categories that enables the making of a global assessment of protected areas as well as inter-nation state comparisons (see IUCN, 1994). Based on the different objectives for which protected areas are managed, six management categories are recognized by the IUCN for compiling the UN List (see Appendix A). A comparison between protected areas in Canada and in China, using the six management categories used by the IUCN and using the UN List of Protected Areas for 1997 provides some insight into the differences between the two countries with regards to the relative importance of different categories of protected areas (see Table 2-1).

Table 2-1

A Comparative Overview of Protected Areas in Canada and China

	Canada		China	
IUCN Management Category	Sites (No.)	Area (ha)	Sites (No.)	Area (ha)
Ia	97	880,882	22	2,8909,417
Ib	16	2,706,511	15	45,728,830
II	316	39, 509,393	20	815,673
III	9	15,193	9	119,715
IV	166	39,769,398	149	5,621,095
V	127	9,216,716	63	4,660,642
VI	130	2,802,421	330	8,372,485
Total	861	94,900,514	608	68,217,857

Note. From "1997 United Nations list of protected areas," by the World Conservation Monitoring Centre (WCMC) and the World Commission on Protected Areas (WCPA), 1998. Gland, Switzerland.

A comprehensive comparison between the two countries in terms of the relative importance of the six management categories is beyond the scope of this study. However, attention needs to be drawn to the difference between Canada and China in the case of IUCN Management Category II. Category II protected areas refer to national parks. In the case of Canada, all 39 of the country's national parks and national park reserves and most of the country's larger provincial parks are recorded as Category II areas. As such, they are managed mainly for ecosystem protection and recreation, and account for over one-third (36.7%) of the total number of sites and over 40 % (41.6%) of the country's total protected areas. Category II areas in China represent less than 5% (3.3%) of the total number of protected areas and account for just over 1% (1.2%) of the total protected areas. Within China, the concept of a national park is less common than areas referred to as national forest parks, nature reserves and scenic areas. Although China has an extensive network of nature reserves (see Nianyong & Zhuge, 2001), and is actively pursuing the conservation of endangered species through its Agenda 21 Program, the Chinese people tend to associate the concept of protected landscapes with areas of outstanding aesthetic value and where there is a close association with the spiritual and cultural dimensions of Chinese history (see Yang, 1995). The designation of many protected areas under the title of "Scenic and Historic Areas" represents the "mix of natural and cultural values producing an harmonious interaction of people and nature" (Lucas, 1992, p. 116) that exemplifies the Chinese application of the IUCN Management Category V, protected landscape.

This relative emphasis on cultural landscapes and specific sites and features has had important implications for both the management and public use of these areas. With the emphasis on landscape aesthetics, a science-based ecological approach has been relatively neglected as a basis for the management of most protected areas (see also Nianyong & Zhuge, 2001; Pritchard, 2001). In addition, the tendency to focus on specific sites and features has hampered the adoption of a more bioregional approach. From a user perspective, the forms of outdoor recreation that are undertaken in such areas are invariably of a more appreciative and contemplative variety and consequently, there is limited involvement and provision for a wide range of active outdoor recreational pursuits that are typically found in Canada's national parks.

Notwithstanding the relative emphasis on appreciative forms of outdoor recreation, there is growing concern about the impact of visitors not least because of the increasing number of people wanting to visit many of these areas. This problem is being compounded by the increasing tendency for scenic sites, forest parks and nature reserves to be "pushed onto the market as tourism products" (Nianyong & Zhuge, 2001 p. 228) under the guise of ecotourism. Both Nianyong & Zhuge (2001) and Pritchard (2001) have observed that the necessary information base for both effective resource and visitor management is not really in place to deal with this increase in visitors. Other shortcomings that have been identified include, inadequate policies and legislation for managing conflicts between protection and development, a lack of unified and authorized plans, and a lack of qualified staff to deal with the growth of ecotourism. In order to address these and related problems, Nianyong and Zhuge recommend that the Chinese should learn from the experience of other countries, including Canada.

Another important difference is that whereas Canada's national parks date back to 1885 and in 1911 was the first country in the world to establish an independent national parks branch (see McNamee, 1993), most of China's protected areas have been established since 1980 (see IUCN, 1998). The historical evolution of policy and legislation as it applies to Canada's national parks has already been reviewed, and specifically the more recent priority being given to the protection of ecological integrity. With the more recent establishment of protected areas in China, it is not surprising that the first comprehensive protected area legislation was not passed until 1984 when the *Nature Reserves Act of People's Republic of China* was enacted. Ten years later, the *Forest Park Management Regulation* was introduced (Xu, 1995). Despite the fact that these pieces of legislation recognized the significance of preserving the natural environment and natural resources, there has been considerable discrepancy between legislation and the actual management of many of these areas. In the early years, in particular, many of the parks and reserves were 'paper parks' (see Ghimire, 1997). Another significant difference between the two countries is that whereas Canada has had an overall systems plan initiated in the early 1970s for the selection and designation of national parks (see Parks Canada, 1997), there would appear to be no such overall plan for protected areas in China. Finally, there is the important factor in both countries regarding the diversity of agencies and levels of government that are involved in protected area designation and subsequent management (see Dearden & Rollins, 1993; Nianyong & Zhuge, 2001). In this context, the available evidence suggests that the involvement and intervention by local political leaders is more pervasive and prevalent in the case of China (See Nianyong & Zhuge, 2001; Pritchard, 2001).

Relevance of Examining Attitudes toward National Parks

The discussion dealing with special interest groups demonstrated that changes in Parks Canada's policies and legislation for managing the national parks have already resulted in widely divergent responses and reactions. In addition, it was noted that both the Parks

Canada Agency and the Federal Minister of Canadian Heritage acknowledge the importance of developing a public constituency of support amongst all Canadians. To develop this support it is important to realize that there is every likelihood that Canadians in general, as well as international visitors, will have a wide diversity of views and attitudes on the priority being assigned to the protection and reinstatement of ecological integrity and the implications that this may have for the human use of the parks. In addition, public acceptance and support of broad public policy is not necessarily complemented by individual attitudes, actions and behavior. People's values and objectives may vary depending on their roles as citizens and consumers (Buchholz, 1993). Unfortunately, research on the public acceptance and the effectiveness of various human use management strategies within national parks is lacking (Parks Canada, 2001a; see also Payne, 1997).

Evidence from the United States suggests that changes in policy and its application at the individual park level may generate negative and unexpected responses from the general public and park visitors. McCool and Lime (1988) for example have observed that, "management actions, while designed to preserve resources, enhance opportunities, and reduce conflict, can negatively impact the visitor" (p. 408). Burton (1981) and Jackson and Dhanani (1984) proposed that "the resolution of this conflict will require a clear understanding of public values and preferences and the incorporation of these attitudes into decision making" (cited in Jurowski, Uysal, Williams, & Noe, 1995, p. 74). More recently, Craig Thomas, Chairman of the Senate subcommittee on National Parks of the United States emphasized that, "if we are intent on success, legislation needs to be daring, innovative--it needs to reflect the concerns the public has about management, money, and the future health of park resources" ("Thomas Unveils", 1998, para. 6). Consequently, research on understanding public attitudes toward national parks and their management is a crucial aspect of policy development and its application through the management plans and day-to day operation of the parks.

During the past decades, there has been growing interest among researchers, managers, and decision-makers in examining the dynamic patterns of public attitudes toward the policies and management of national parks and other protected areas (Ewert, 1996a, b; LaPage, 2000; Machlis, 1996). Machlis (1996) emphasized that, "understanding the relationship between people and parks is critical for protecting resources unimpaired and providing for public enjoyment" (Introduction, para. 1). This need is especially the case in a dynamic and multicultural country such as Canada.

The importance of examining the attitudes of ethnic groups toward national parks has been widely recognized. Winter (1966) emphasized the importance for natural resource managers to match public policy with diverse populations that have varied values, attitudes, and beliefs towards natural resources (cited in Ewert, 1996b). Bass, Ewert, and Chavez (1993) have argued that managers of natural environmental sites such as national parks need to take into consideration the participation patterns and perceptions of the site visitors with ethnic and racial backgrounds. Likewise, Decker, Boxall, Just, and Wellstead (1993) have noted that human dimensions inquiry that focuses on the topic of values, attitudes, and beliefs is anticipated to increase given projected changes in the demographics of American society that is becoming increasingly urban and multicultural (cited in Ewert, 1996b). More specifically, Floyd (1999) proposed that there is a need to examine perceptions held by minority groups toward national parks, and suggested that:

> Such studies might focus on general issues such as attitudes toward natural and cultural resources and disposition toward recreational use of such resources among racial and ethnic minorities. Studies might also focus on specific issues, such as attitudes and behavioral disposition toward specific parks, park resources, facilities, or programs. (p. 18)

He has also pointed out "there has been no research on attitudes and perceptions of recent immigrant populations toward park management practices" (Floyd, 2001, p. 47). In particular, it is unknown if a racial and ethnic group, such as the Chinese in Canada, share similar attitudes toward national park management practices as those expressed by Anglo-Canadians. Existing evidence suggests that minority groups may have different perspectives and opinions about the balance between development and preservation of natural settings. Meeker, Woods, and Lucas (1973), for example, suggested that blacks, native-Americans, and whites have different perspectives toward natural settings (cited in Edwards, 1981). More specifically, Dragon (1986) has offered preliminary evidence that native-Americans and whites hold different views about the appropriate use of national parks (cited in Allison, 1988).

In view of the almost complete absence of research on specific ethnic groups and their attitudes toward national parks, the purpose of this research is to compare and examine similarities and differences of attitudes toward national parks between Chinese living in Canada and Anglo-Canadians. To this end, three attitude measures will be developed. Two of them will be used to examine the general attitudes of the survey population toward the revised policy as well as the roles and functions of national parks, respectively; the third measure will examine the specific attitudes of the survey population toward appropriate uses within these protected areas.

Attitudes toward National Parks

A sharp rise in the interest of government and public attitudes toward North American national parks began to emerge in the 1960s (Smith & Alderdice, 1979). Over the last forty years, the public has shown increasing concern about decision-making and management practices relating to national parks.

McCool and Lime (1988) outlined six specific themes of natural resource and park attitude research: (a) research on heavy-handed vs. light-handed management actions, (b) research on use-limit policies, (c) research on activity controls, (d) research on attitudes toward facilities and developments, (e) research on attitudes toward information, and (e) research on fees. Generally, attitude research that incorporate themes (b), (c), and (d) may be classified as addressing issues relating to appropriate uses. McCool and Lime (1988) pointed out “management actions, particularly those which limit, control, or restrict visitor activity, may directly interfere with the nature of recreation itself, such management actions are designed to secure uniformity rather than enhance diversity” (p. 408). A number of studies have been conducted to examine the public or park visitors’ attitudes toward programs, management actions, potential policies, activities, facilities, and services. The following is a brief review of previous findings on park attitudes at the general and specific levels.

Attitudes are generally viewed as being composed of three components: cognitive, affective, and behavioral. In terms of these three components, general attitudes toward national parks refer to individuals' knowledge and beliefs about national parks (cognitive), their feelings or liking or disliking about national parks (affective) and their past, present, and intended actions of national parks (behavioral) (see Rollins & Robinson, 2002). The cognitive component of attitudes toward national parks focuses on revised policy and the roles and functions of national parks and the way in which people perceive them and is central to an individual's knowledge and belief system about national parks. For the purpose of this research, only the cognitive component of attitudes toward national parks that involves knowledge and beliefs about the revised policy, and roles and functions of national parks will be examined.

Although the measurement of this component of attitudes is not a direct measurement of how much knowledge an individual has about parks, it can reflect indirectly an individual's general perception on national parks. Measurement of an individual's knowledge and beliefs about national parks may be used as an intermediate gauge of how much information he or she has acquired directly from Parks Canada or from alternative sources. Thus, cognitive measurement of national park attitudes is an indicator that may be used to direct park information communication strategies. Due to the fact that changes in beliefs may lead to attitude change, and eventually the behavior change, an examination of the cognitive dimension of national park attitudes is extremely relevant.

General Attitudes toward the Revised Policy

As there is no study that has been done to examine the public reaction to the revised policy, a review of relevant empirical findings will largely draw upon previous studies on the public and/or visitors' perception and awareness of policy of national parks.

Smith and Alderdice (1979) examined the regional communities' awareness of new official policies adopted by Point Pelee National Park, Canada. Three aspects of the park policy awareness were assessed: (a) the emphasis on the natural phenomena of the park in official park policy, (b) the removal of private homes and/or cottages from the park, and (c) the phasing out of motor vehicle operations within the park. Results indicated that neither of the two survey population groups--Windsor residents and county residents--was highly aware of the policy with only 34% of county residents and 19% Windsor residents being classed as aware.

Kiely-Brocato (1980) developed a measurement scale to examine visitor attitudes toward policies or actions on resource use and management taken by managers at Shenandoah National Park, the United States. The scale comprised two components: cognitive and affective, and each component contained 44 items. The main concern with the cognitive component was to measure how visitors perceive a policy or action taken by the park. Policies or actions reflected in the scale involve the use permission of recreational activities such as motorized "off the road" vehicles, camping, and hunting, horse travel, and berry picking, management regulations on campfires, animal touching, tree cutting for clear campsites, visitor limitation, building prohibiting, and fire control. The results indicated that the overall attitudes toward resource use and management of the park were fairly positive.

More recently, Papageorgiou (2001) examined the visitor attitudes toward operating regulations in Vikos-Aoos National Park, Greece. Visitors were asked to assess the allowability of seven types of activities in the park's buffer zone periphery. These activities ranged from passive ones (walking, barbecue) to specialized ones (sports, hunting, camping), and to large-scale commercial activities, and were specified by the park's operational regulations as detrimental to natural resources. The results showed that four of the seven activities such as barbecue, building, camping, and walking had a correct response rate of more than 60%. The only two restricted activities--building and barbecue--had the higher correct response rates of 81% and 75.7%, respectively. The response rates for other three activities such as football, hunting, and road construction were unexpectedly low. Overall, results indicated that, "respondents perceive national parks as places utterly restrictive of human activities" (p. 68).

Miller, Dickinson and Pearlman-Houghie (2001) conducted a study in England to examine public understanding of the term "quiet enjoyment" and its influence on attitudes toward recreational activities within the national parks in England and Wales. The phrase "quiet enjoyment" was not included within the Environmental Bill despite the strong recommendation made by the Edwards Panel report (National Parks Review Panel, 1991, cited in Miller et al. 2001). The contention was that the omission of the term in the Bill could weaken both the legislation and the ability of National Park Authorities to restrict damaging activities within National Parks. Results indicated that six themes regarding the term "quiet enjoyment" emerged form the public: need for solitude; being in harmony with the natural environment; silence and peacefulness; contemplation and personal reflection; relaxation and stress reduction; and activities. Recreational activities that are commensurate with the connotation of "quiet enjoyment/recreation" were also investigated. This study provides the basis not only for management and policy decisions as to what activities associated with the ideas of "quiet enjoyment/recreation" should be controlled within national parks, but also clarifies that either of the two terms "quiet enjoyment" and "quiet recreation" can be included in management and policy documents.

The above four studies are either park or sample specific. In contrast, Angus Reid Group (1993) conducted a nation wide public opinion survey to examine Canadians' attitudes and behavior toward Canada's national parks. The main purpose of this survey is to understand public response to Parks Canada's several proposed initiatives and to "provide a benchmark of opinion against which reactions to changes in service or operation can be measured in the future (p. 1). The findings of this survey are very positive. First, Canadians overwhelmingly support Park Canada's intention to place first priority on preservation and protection of natural environments within the existing national park boundaries. Of all survey regions, Alberta demonstrates the strongest support with 66% of the residents viewing preservation as the most important priority. Second, the vast majority of Canadians support Parks Canada to limit development and access when needed to protect national parks.

General Attitudes toward Roles and Functions of National Parks

According to the IVth World Congress on National Parks and Protected Areas, national parks (IUCN, 1994) are defined as:

> Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible. (p. 19)

This definition makes it clear that the roles and functions of national parks are at least demonstrated in six aspects: preservation of ecological integrity, places of emotional and spiritual attachment, scientific research and monitoring, places for environmental/cultural/historical education, places for recreation pursuits, and tourism destinations. The following is a brief review on findings relating to these six dimensions of national park definition.

Preservation of ecological integrity. The fundamental role of national parks is to protect the ecological integrity of park environments. However, most of Canada's national parks failed to achieve this goal. For example, according to Parks Canada's State of the Parks 1997 Report, the majority of parks are facing significant and accelerating loss of ecological integrity with 31 out of 38 national parks at that time reporting ecological stresses from significant to severe (Parks Canada Agency, 2000b).

Canadians are well aware of the ecological problems occurring within national parks. According to the 1993 Environmental Citizenship Survey (Angus Reid Group, 1993), most Canadians considered the protection and preservation of ecological significant areas to be the first priority of national park management whereas the provision of opportunities for public education and recreation was considered to be of lower priority.

Similar findings were found in the United States. According to Borrie, Freimund, and Davenport's (2002) study, visitors to Yellowstone National Park place greater value on protecting the flora and fauna within the park with an average value of 7.0 (the highest value is 8) reported on such three items as "a wildlife sanctuary", "protection for fish and wildlife habitat", and "a protector of threatened and endangered species."

In contrast to findings in Canada and the United States, visitors' knowledge about the role of national parks in Greece seems to be poor. For instance, nearly 30% of respondents reported that, "parks are areas to protect endangered species of flora and fauna" (Papageorgiou, 2001, p. 67). The little knowledge the visitors have indicates that, "the knowledge-raising efforts should go a long way towards establishing a positive attitude for the resource" (p. 61).

Places of emotional and spiritual attachment. One important aspect of affective feelings on a particular object is the emotional or symbolic attachment to the object. National parks are important places to which people are emotionally or symbolically attached. Warzecha and Lime (2001) examined the emotional/symbolic and functional place attachments of two groups of river users in Canyon lands National Parks: Colorado River users and Green River users. Both groups showed higher attachments toward the rivers with the emotional /symbolic and functional mean values being 3.80 and 3.33 for Colorado River, respectively, and 3.98 and 3.59 for the Green River, respectively, based on a 5-point Likert scale. Another study also found Americans are highly symbolically attached to national parks. For instance, in response to Yellowstone National Park as "a symbol of America's identity", visitors to the park reported an average value of 6.8 out of 8 on the item.

Similar to their American counterparts, Canadians are also highly attached to national parks, emotionally and symbolically. "Canadians feel a sense of involvement in, and responsibility for, their national parks" (Banff-Bow Valley Study. 1996, p. 15). For those Canadians who are frequent park goers, they cherish their family memories and traditions entangled with the waters, trees, mountains, fish and wildlife of the parks; they treat parks as havens for the soul and for replenishment, where they seek peace, solitude, and pure pleasure from wilderness. For those who rarely visit parks, national parks are green spaces in the mind (Parks Canada Agency, 2000b). Canadians are so highly concerned about national parks that 71% of Canadians see national parks as the fourth “very important” symbol of Canadian identity (the first three are the Charter of Rights, the flag, and the health care system). The importance of national parks among Canadians is greater than that of the national anthem, the Royal Canadian Mounted Police, the Canadian Broadcasting Corporation, and hockey (Environics, 1997, cited in Parks Canada Agency, 2000b).

Scientific research and monitoring. Scientific research and monitoring in national parks play a fundamental role in maintaining ecological integrity. In the parks’ early history, less attention was paid to scientific research. However, the need for more scientific research in parks has been necessitated by land use and other environmental changes and the growth of tourism and commercial and residential development in the parks (Parks Canada, 2001c).

The role of scientific research and monitoring in national parks is twofold. On the one hand, parks can be better managed and administrated through the application of findings from scientific research, both natural and social. On the other hand, scientific research provides educational resources that are essential for public education.

Borrie et al. (2001) examined visitors’ understanding of the role that Yellowstone National Park plays in scientific research and monitoring. Respondents reported an average value of 6.3 out of 8 on this question, suggesting a moderately higher appreciation of the park’s role in scientific research.

Places for environmental/cultural/historical education. Ecological understanding and education are seen as important purposes for national parks. National parks can play a key role as centres for learning and educating about Canada's natural, historical, and cultural environments. People tend to place higher value on the role of national parks as educational places. For instance, visitors to Yellowstone National Park assigned an average value of 7.0 to emphasize the importance of the park as a place for education about nature, and 6.9 as a place for historic resource (8 refers to the highest importance) (Borrie et al., 2001).

Places for recreation pursuits and tourism destinations. National parks are amongst the most visited natural areas worldwide. For example, in the United States, almost 1 out of 3 Americans visited the country's national park systems. In Canada, more than 16 million person-visits visited 36 Canadian parks during 2000-2001 (Parks Canada Agency, 2001).

Borrie et al. (2001) examined visitors' attitudes toward the importance of Yellowstone National Park as a place for recreational activities and tourist destination. Results indicate that values placed on these two aspects are not very high with 6.4 for the former and 6.2 for the latter, compared to much higher values placed on preservation of park resources, education, and symbolic identify. This finding is consistent with that found in Canada that most Canadians place higher priority on protection and preservation of park resources, compared to lower priority placed on public education and recreation (Angus Reid Group, 1993).

Specific Attitudes toward Appropriate Uses of National Parks

The concept of appropriate uses is usually taken to refer to "both the activity, and the facilities and services that support the activity" (Banff-Bow Valley Study, 1996, p. 246). Although the Ecological Integrity Panel (Parks Canada Agency, 2000d) observed that there is no systematic framework in place to make decisions regarding allowable and prohibited activities, a number of general guidelines and steps for assessing appropriate activities have been developed (see Nilsen & Taylor, 1999; Parks Canada, 1994; Parks Canada Agency, 2000d).

Appropriate activities are a sub-set of what are considered allowable activities. An allowable activity is defined as, "one which does not contravene the National Parks Act and Regulations for Parks Canada and which may also be appropriate to the conditions in a specific heritage area" (Parks Canada, 1994, p. 9). The Ecological Integrity Panel observed that allowable activities are the outcome of historical precedent, particular park establishment agreements, and idiosyncratic circumstances. In addition, the grounds for prohibiting certain activities reflect a combination of ethical, human safety and environmental reasons. Irrespective of historical precedence, the Panel noted that although many activities were deemed acceptable in the past, "the changing nature and magnitude of many such activities now raises questions regarding their impacts on ecological integrity" (Parks Canada Agency; 2000d, pp.11-15). At the same time, the Panel acknowledged that any changes that might prohibit existing activities and related facilities would likely be highly controversial.

Appropriate visitor activity is defined in the *Parks Canada, Guiding principles and operational policies* (Canadian Heritage, 1994, p. 118) as:

1. Is consistent with these policies and the protection of ecological and/or commemorative integrity of protected heritage areas.
2. Is specially suited to the particular conditions of a specific protected area.
3. Provides the means to appreciate, understand and enjoy protected heritage area themes, messages and stories.

The Panel on Ecological Integrity (Parks Canada Agency, 2000b) made a number of relevant observations in relation to the appropriate use issue. First, the Panel noted that the measure of appropriateness includes both the actual use but also the level of use. Second, it stated that although an activity may be allowable within a park, that activity might not always be appropriate. Third, the Panel drew attention to the need to consider the cumulative effects of activities and uses. Finally, the Panel concluded that appropriate activities and required facilities should meet all of the following criteria related to ecological integrity: (a) appropriate in terms of "basic and essential" services, (b) appropriate in terms of local environmental, social, and economic conditions, (c) appropriate in terms of numbers of visitors and timing, and (d) appropriate in terms of demand for long-term use.

There is a substantial research literature that confirms the impact that various forms of recreation and tourism have on park environments (see Newsome, Moore, & Dowling, 2002), including appreciative forms or recreation activity, such as wilderness hiking (Nilsen & Taylor, 1999). However, in the absence of a formal program for assessing activities and facilities in national parks, the diversity of views amongst the public and park visitors as to what constitutes appropriate activities and associated facilities is not surprising. Divergences might be particularly evident between or within a minority group such as Chinese in Canada, or the majority members such as Anglo-Canadians. Although public opinion or demand alone is not sufficient for justifying the provision of some uses, "an understanding of the diverse preferences may provide insight into appropriate use of the resource environment" (Jurowski et al., 1995, p. 83), and is certainly relevant information to the development of park management policy and practice.

Recreational activities. Recreational activities may be classified into two broad categories: appreciative or passive (includes hiking, camping, and photography) and consumptive or active (includes hunting, fishing, and snowmobiling). Existing studies both in North America (see Littlejohn, 2000; Smith & Alderdice, 1979) and England and Wales (see Miller et al., 2001) have generally found that people tend to consider appreciative activities are more appropriate than consumptive ones within national park settings.

A nation wide survey across Canada conducted by Angus Reid Group (1993) indicated that golf courses are considered to be the most inappropriate activity for national parks with 51% of respondents perceiving that they should not be in a national park or that there are too many. Other inappropriate uses are small planes (48%), and downhill ski areas (34%). A similar local survey was conducted by Angus Reid Group (1996) to identify appropriate activities for Banff National Park. The results indicated that the most appropriate activities are wildlife reserves, hiking, picnicking and bird watching while gambling casinos, Video lottery terminals (VLTs), new golf courses, theme parks, and motorized boating were ranked as the least appropriate uses in the park (cited in Banff-Bow Valley Study, 1996).

An interesting comparison is the 2000 Alberta Recreation Survey (Alberta Community Development, 2000). Although Alberta's provincial parks have a dual mandate not unlike their national counterparts, there is a tendency for most of the parks within the provincial system to have a more distinctive recreation role. In response to a question inquiring as to which activities should be allowed in provincial parks, cross-country ski trails (77.8%), and mountain biking (70.7%) received the highest level of support, whereas, motorized off-road vehicles (16.7%), and hunting (12.6%) received the lowest level of support.

Facilities and services. Facilities and services within or around parks can be divided functionally into three general types: commercial (accommodations, shopping), educational (information centres, interpretative centres, schools, etc.), and others (including hospitals and post offices). The Banff-Bow Valley Study recognized three distinct categories of commercial enterprises: those that provide basic services (for example, restaurants, grocery stores, hotels); those that do not meet the basic needs of visitors (jewellery shops, stores selling high end luxury goods, manufacturing businesses; and those that fall between these two extremes (Banff-Bow Valley Study, 1996). Public opinion regarding the acceptability of these facilities and services tended to be reflective of whether or not respondents considered that the primary role of national parks to be protection or public enjoyment and recreation (see also Nelson, 1973, cited in Smith & Alderdice, 1979).

According to Angus Reid Group (1993), nearly 25% of Canadians view hotels in national parks to be inappropriate, and 25% reported that there are too many gift stores in national parks. In addition, over half of Canadians (57%) reported that no more town site development should be permitted in national parks. A similar survey was taken again by the Group in 1996 to understand Calgary residents' attitudes toward appropriate use of Banff National Park. Results showed that hospitals and interpretive centres were regarded by a majority of respondents (67%) as the most appropriate facilities. 46% and 45% of respondents rated gas station and schools as appropriate, respectively.

In comparison with surveys regarding national parks, one of the aims of the 2000 Alberta Recreation Survey (Alberta Community Development, 2000), is to understand Alberta residents' attitudes toward role of provincial parks of the province. In terms of facilities, grocery stores/laundromats (70.7%) received the highest level of support, whereas private cottages (19.8 %) received the lowest level of support. In a corresponding survey that was undertaken in 1992, respondents indicated that the protection role of provincial areas and the provision of outdoor recreation facilities were of approximately equal importance (Alberta Tourism, Parks and Recreation, 1992). In the case of facilities, respondents indicated that grocery stores/laundromats (65.4%), and gas stations (62.8%) received the highest level of support, whereas private cottages (21.5%) received the lowest level of support.

Generally, the results from other research on attitudes toward facilities and developments appear to be consistent with the Canadian data that applies to national parks. "Visitors tend to prefer the current level of development and generally oppose expansion in number and types of facilities" (McCool & Lime, 1988, p. 405). Buckley and Pannell (1990) reported that visitors to natural areas in Australia and the United States expected little or no development (cited in Chin, Moore, & Wallington, 2000). Chin et al. found that visitors to Bako National park in Australia were least supportive of visitor facilities such as accommodation among eight potential management actions. Smith and Alderdice's (1979) study indicated that residents from both urban and semi rural areas consistently prefer a low level of provision of park services. Although these findings generally refer to specific parks, McCool and Lime noted that further research needs to focus on the general public attitudes toward national parks rather than site-specific users. This current research will focus on public attitudes toward Canadian national parks in general.

Summary and Conclusion

Based on the literature review, it is evident that the maintenance of ecological integrity is now unequivocally seen by Parks Canada as the first priority, and that the human use of national parks has to be managed in such a way that this integrity is not impaired or compromised. However, conflict between preservation and visitor use will not be mitigated automatically despite the fact that the preservation of park environments is now legislated as the first priority. Although there is a general acceptance that national parks have a unique role to play in protecting attractive landscapes and biodiversity, considerable divergences remain as to the extent to which this mandate should limit and constrain opportunities for public enjoyment and recreation. In particular, there is little, if any, existing research evidence to indicate how people are going to respond to this strengthening of the protection mandate and the potential restrictions on recreational activities, facilities and services. This omission is particularly the true for minority groups such as the Chinese community in Canada. Consequently, this study is intended to redress this omission.

Public opinions on national parks can be used as a starting point against which managers and policy makers can make decisions by incorporating their owns and opinions of those stakeholders and vested interest groups involved. It should keep in mind that public reaction to the changes of Canada's national park policy is unlikely to be uniform but will range from positive or negative. Whatever the results, any decision making on national parks should be made against the criteria of ecological integrity.

In light of the attitudes of Chinese in Canada toward national parks, it can be anticipated that Chinese with lower levels of acculturation could exhibit greater difference in attitudes than those with higher level of acculturation, compared with their Anglo-Canadian counterparts. In part this may be due to the differences between national parks in Canada and China in terms of their respective legislated and policy roles and management practices. Therefore, those recently arrived immigrants who usually are less acculturated could perceive Canadian's national parks based on their past experience back in China, whereas those who have settled down in Canada for a longer time and are more likely to be acculturated at a higher level, and may perceive national parks based more on their experience in Canada. As a result, their understanding about national parks can be expected to be more similar to that of their Anglo-Canadian counterparts.

In addition, it should be noted that issues regarding the protection of park resources are inherently related to issues regarding the relationship between human beings and nature. As will be discussed in the next section: environmental attitudes, harmony with nature is a traditional Chinese cultural value. This harmonious human-nature relationship is in conformity with the ideas reflected in the NEP, which represents a value shift in the early 1980s in Western society from human over nature to human with nature. Thus, if

Chinese still hold the traditional cultural value of human with nature, attitudes held by Anglo-Canadians and Chinese in mainland China toward nature and the environment as a whole, and national parks specifically, may have converged. If that were to be the case, no evident differences would be detected between the two groups. In view of this, Chinese in Canada and in mainland China may share the similar attitudes toward national parks with Anglo-Canadians, regardless of the influence of acculturation. However, to make the situation more complex, traditional cultural values including values on human and nature relationships have declined since the 1980s (Wu, 1999). Consequently, recently arrived Chinese from mainland China may hold different attitudes from Anglo-Canadians toward national parks. If this is the case, acculturation will function as a catalyst that brings about attitude changes of Chinese immigrants in a way that conforms the mainstream society.

Environmental Attitudes

During the late 1960s, the conservation movement began to realize that conserving wildlife and natural settings was not the same as protecting the environment as a whole (Dwyer, Leeming, Cobern, Porter, & Jackson, 1993). Consequently, the conservation movement began to change, expand, and evolve into the environmental movement.

The argument has been made that environmental problems are largely ingrained into the traditional values, attitudes, and beliefs of a given society. For example, more than two decades ago, Maloney, Ward, and Braucht (1975) pointed out that, "we must determine what the population knows, thinks, feels, and actually does regarding ecology and pollution" (p. 787). Maloney and Ward (1973) emphasized that, "these are necessary antecedent steps that must be made before an attempt can be made to modify critically relevant behaviors" (p. 584; cited in Maloney et al., p. 787).

Different populations with distinct value systems may hold different values on, and attitudes toward, the same object or phenomenon including the environment. However, due to social and economic development, traditional value systems in different countries or regions may undergo change. Also, due to changes in the physical and social environments, an immigrant may experience changes in his or her traditional environmental value system during the process of acculturation.

In this section, therefore, various theories and empirical findings related to environmental attitudes and/or environmental concern will be reviewed. Additionally, a brief comparison of Chinese and North American environmental value systems will be provided, as well as the changing patterns in these values. Furthermore, as the focus of this section is on the influence of acculturation on environmental concern, emphasis will be placed on comparing environmental concern among ethnic minorities, while taking into account the effect of acculturation. However, because most previous studies have been conducted using ethnic groups such as Blacks and Hispanics (rather than Chinese), this review will be based on findings associated with these two groups.

Environmental concern emerged in the late 1960s, stabilized in the 1970s, and began to rise dramatically in the 1980s (Wall, 1993). Accordingly, research regarding environmental concern became popular in the early 1970s. To date, the literature on environmentalism can be divided into two major groups: (a) studies focused on the relationship between socio-demographic characteristics and environmentalism, and (b) studies focused on the relationship among values, beliefs and other social psychological constructs and environmentalism (Dietz, Stern, & Guagnano, 1998). The following provides a brief review of this literature, with particular emphasis being placed on the latter.

Socio-demographic Characteristics and Environmental Concern

The earliest research regarding environmental concern focused on socio-demographic characteristics of individuals such as age, education, income, and residential location (Samdahl & Robertson, 1989). Van Liere (1978) found that environmental concern is related to certain demographic characteristics, with later studies indicating that such factors as age/cohort, education, place of residence, and political ideology were significantly related to environmentalism (Dietz et al., 1998; Fransson & Garling, 1999; although some research suggests that these relationships have weakened in recent years; Fransson & Garling, 1999). Other factors, such as gender and race, have demonstrated weaker and less consistent relationships with environmentalism (Dietz et al., 1998), while still other factors, such as income and occupational prestige, have not demonstrated any consistent relationships (Sheppard, 1995). According to Mitchell's (1980) study, levels of environmental concern were "fairly evenly distributed across sex, race, age, income and rural-urban categories" on a variety of environmental issues (p. 28; cited in Jones & Cater, 1994, p. 563). Similarly, Gooch (1995) found that no significant correlations were identified between environmental concern and age, sex, nationality, or education in three countries: Sweden, Estonia, and Latvia. Furman (1998) also reported that no particular demographic group exhibited higher environmental concern than any other in a study conducted in Turkey.

Because of the above, research has increasingly focused on other variables, including people's beliefs, norms, and attitudes toward the environment. One such variable--value orientation--has been found to play an essential role in guiding individuals' decisions with respect to ecological issues. Consequently, value orientation is discussed more fully in the next section.

Social Psychological Bases and Environmental Concern

Stern, Dietz, and Guagnano (1995) have argued that, "research on environmental concern would benefit greatly from a more explicit social-psychological model" (p. 723). Dietz's et al. (1998) findings also suggest that there were stronger associations between environmental concern and social psychological variables such as attitudes, beliefs, and worldviews, than socio-demographic variables.

Stern (1992) identified four value orientations related to environmental concern (cited in Fransson & Garling, 1999). They are the NEP (which will be discussed more fully in next section: Research Methods), Anthropocentric altruism, Self-interest, and Postmaterialism. It is important to recognize that all of these value orientations toward nature and the environment, to some extent, overlap other value orientations or basic beliefs proposed by other researchers. For example, according to Stern and Dietz (1994), since the 1970s, the literature began to connect environmental concern to three classes of valued objects: other people, nonhuman objects, and the self. These three valued objects also correspond with three "ethics" identified by Merchant (1992)--the homocentric, ecocentric, and egocentric--which are also conceptually similar to the three value orientations identified by Stern, Dietz, and Kalof (1993): egoistic, social-altruistic, and biospheric.

Chan (2001) identified two of the five value orientations proposed by Kluckhohn and Strodtbeck (1961)--man and nature orientation and relationship orientation--as being closely related to environmentally friendly attitudes and behavior, and that, the traditional Chinese man-nature value orientation and collectivism had a significant bearing on Chinese consumers' attitudes toward green purchases. Arguably, ideas reflected in the NEP scale are conceptually equivalent to the man-nature value orientation, while anthropocentric altruism and self-interest fall in the category of relational orientation.

Man-Nature Value Orientation

According to Kluckhohn and Strodtbeck (1961), the relationships between man and nature can be described in terms of one of three different approaches: subjugation to nature, harmony with nature, or mastery over nature. Traditionally, harmony with nature has been the dominant philosophy of Chinese culture "in many periods of Chinese history" (Kluckhohn & Strodtbeck, 1961, p. 13) while the mastery over nature is the dominant orientation of most Americans.

Historically, Chinese culture and Chinese people's values and attitudes toward nature and the environment have been profoundly influenced by Taoism, Confucianism, and Buddhism. Although Taoism "turns to the nature itself," while Confucianism "turns to human nature as the motivating force to do good" (Watch Tower Bible and Tract Society of Pennsylvania, 1990, p. 185), both of these philosophies share a fundamental similarity in concepts and explanations of the universe (Yu, 1987), in that they each emphasize the natural forces of the universe such that "all nature works by itself" (Yu, 1987, p. 15). Furthermore, while both doctrines are more materialistic and dialectic than realistic, Taoism is the more dialectic of the two (Yu, 1987). According to Taoism, humans are linked to nature and are part of nature. Peaceful coexistence with nature is fundamental to Taoist activity (Kaza, 1999), and "excessive forces in a particular direction tends to trigger the growth of an opposing force" (or *wujibifan* 物极必反; Wing, 1986, p. 11). This view of nature is equally applicable to society and individuals by way of "*wuwei*" (无为), a tenet of Taoism which advocates passive achievement and simplicity by following the natural forces or the flow of events (Majka, 2000; cited in Wang & Stringer, 2000). Similarly, Confucian philosophy emphasizes human's harmony with nature by adapting human behaviors to the rhythms of the natural world (Tucher, 1994; cited in Kaza, 1999). To some degree, this traditional Chinese man-nature orientation is similar to the ecocentric orientation identified in Western literature (Chan, 2001).

Gardner and Stern (1996) propose that there is a value orientation shift among people from anthropocentric altruism orientation and self-interest orientation to ecocentric value orientation (cited in Fransson & Garling, 1999). According to these researchers, ecocentric people care about the whole ecosystem in its own right, while "non-egoistic behavior, including environmentalism, may also be motivated by biospheric values that extend beyond the human species" (p. 326). Not surprisingly, therefore, Gardner and Stern's measures of biospheric value orientation include some items that overlap with the NEP scale.

Another pervasive Chinese attitude towards nature is inherent in Buddhist ideas, which is evidenced by its protection of mountains and trees, especially those around sacred areas. Generally, Buddhism is also ecocentric rather than anthropocentric (Sponsel & Poranee, 1993).

While these three religions encourage harmonious relations between people and nature, in practice at least, particularly after 1949 when the People's Republic of China was established, traditional Chinese values toward nature have undergone considerable change. This change was a result of religions being banned and temples and churches being destroyed, particularly during the Cultural Revolution (1966-1976). As a consequence, China's landscapes since 1949 have been deforested, fragmented, and destroyed, and more recently, pollution involving the "three wastes" (i.e., waste gas, waste water, and waste slag) has become a serious environmental problem. Another factor affecting China's landscapes has been the 1978 adoption of an "open door" policy whereby the Chinese government became more open to the outside world in an attempt to modernize China. To this end, traditional Chinese environmental ideas have been further devalued as they are considered to be obstacles to the development of a modernized society (Wu, 1999). However, from the 1980s on, temples and churches have been rebuilt and expanded, although this development has not been advocated by the central government. In addition, the central government no longer regards religious activities as superstitious and illegal, and traditional Chinese values have also been promoted and enhanced in recent years.

Many Western scholars have been confused by China's "un-Taoist action to nature" (Tuan, 1968), particularly in light of the seemingly antithetical trends of traditional Chinese religions becoming active again on one hand and the central government's desire to modernize Chinese society on the other hand. An explanation to this situation may partially lie in the fact that the central government has been trying hard to react against the increasing Westernization of Chinese society by promoting traditional Chinese values and cultures. This active resistance to the expansion of Western civilization has contributed considerably to the maintenance of people's traditional Chinese cultural identity (Yu, 1987), which may be reflected by Chinese exhibiting greater environmental concern than North Americans (Brechin, 1999).

In contrast with China, people in North America have historically believed that nature is supposed to be utilized to serve humans. Traditionally, Western society has held an anthropocentric worldview that sees humans above and exempt from the rest of nature. Under this umbrella, the pursuits of maximum economic growth and material abundance driven by the advancement of science and technology become the goal of the society. This worldview has been termed the dominant social paradigm (DSP) by Pirages and Ehrlich (1974).

The dominant social paradigm became less popular in the West in the 1970s when environmental awareness emerged. During this period, a large group of people began to realize that the earth is delicate and possesses limited resources, and irresponsible economic behavior will bring about subsequent environmental problems. Wall (1982), for example, has found that North American perceptions of the land have shifted to love and appreciation of wilderness from an earlier emphasis on dominance and fear (cited in Jackson, 1986). Similarly, Kempton, Boster and Hartley (1995) found that a majority of respondents support environmental protection, and that environmental protection is justified to a large extent by both the needs of future generations as well as aesthetic enjoyment. In fact, approximately half to three-quarters of all Americans now consider themselves to be environmentalists (Kempton et al., 1995).

This new worldview has been termed the New Environmental Paradigm (NEP) by Dunlap and Van Liere (1978). The NEP attempts to explore the "primitive belief" of humans in natural world, and the ideas expressed by the NEP are consistent with traditional Chinese philosophies rooted in Confucianism and, especially, Taoism.

Relational Value Orientation

A collective value orientation, common among the indigenous Chinese and Oriental worlds, can be contrasted with the individualistic value orientation popular in North America and other Occidental worlds. Indeed, collectivism and individualism are two central themes in Asian cultures, and Western European and North American cultures, respectively (Louie, 1997), with collectivism focusing on other people while individualism focuses on the self (Schultz et al., 2000). These relational differences are important because they also affect environmental worldviews. Stern et al. (1993) propose three value orientations that guide the public's pursuit of environmental quality: egoistic, social-altruistic, and biospheric. People holding an egoistic value orientation emphasize personal gain, whereas people guided by social-altruistic values are most directly concerned with social good. In contrast with these two orientations, Biospheric people judge environmental decisions in terms of perceived costs or benefits to ecosystems (Axelrod, 1994). The following is a description of the relationships between environmentalism and altruism and self-interest.

Anthropocentric altruism. According to this thesis, the central concern and the main reason for caring about the environment is that degraded environmental quality poses a threat to people's well-being (Blacks, Stern, & Elworth, 1985; Hopper & Nielsen, 1991; Van Liere & Dunlap, 1978; cited in Fransson & Garling, 1999). This thesis originates from Schwartz's (1977) theory of altruism, and has been used in the past decade or so in a number of studies of environmental attitudes and behavior (cited in Widegern, 1998). Stern et al. (1993) argued that Schwartz's model is a special case of a social-psychological theory of altruism which assumes that "people have a general value orientation toward the welfare of others, that is they value outcomes that benefit others and can be motivated to act to prevent harm to others" (p. 324). This assumption is in line with Confucianism's principle of doing good for others.

Self-interest. According to the self-interest thesis, environmental concern is a function of individuals' self-interest. For example, Baldassare and Katz (1992) found that personal threats associated with environmental deterioration are an important reason for why people are concerned with the environment (cited in Fransson & Garling, 1999). This thesis has also been used to explain why environmental concern among Americans declined in the early 1970s (Wall, 1993). According to Wall (1993), "the fact that environmental concern appeared to be disproportionately concentrated among those with higher incomes, educational levels and occupational prestige lent support to the self interest theories" (p. 2). For example, NBC News' 1991 poll found that Americans considered hazardous waste, solid waste, and garbage the most important environmental issues (cited in Valenzuela, 1995). Thus, concern over the ecosystem management appears to be too distant from the everyday concerns of most Americans, and very far from the minds of most of the poor (Valenzuela, 1995).

The self-interest thesis may find its source in social exchange theory, which provides a conceptual base for understanding the exchange of resources of any kind, concrete or symbolic, and between individuals or groups (Jurowski, Uysal, Williams, &

Noe, 1997). Individuals tend to evaluate the exchange relative to their personal benefits and costs from the exchange. For example, from a tourism perspective, Jurowski et al. (1997) found that residents who perceive that personal benefits of tourism overvalued personal costs were more likely to support tourism development. Similarly, Widegern (1998) argued that pro-environmental behaviors might be treated as a paradigmatic case of the collective action problem, or "free-rider" dilemma. In this instance, collective behaviors were seen as resulting from each individual acting in his or her own rational self-interest.

Postmaterialism

Schwartz and Bilsky (1987) identified three core domains that they referred to as "universal human requirements. These included (a) biologically based needs, (b) social requirements, and (c) group welfare and survival. These domains somewhat parallel Maslow's (cited in Axelrod, 1994) needs hierarchy, both in content and in that only after a person's basic needs are met can he or she afford to worry about the environment. Therefore, affluence and its concomitant shift in values were seen as prerequisites for environmentalism.

The ideas reflected in Maslow's hierarchy of needs theory are theoretically consistent with Inglehart's postmaterialist values thesis and more generally with the emergence of research on new social movements (Brechin, 1999). According to Inglehart (1977, 1990), postmaterialist values involve "de-emphasizing material (economic) concerns relative to nonmaterial values such as self-actualization, peace, happiness, better environmental quality, and general quality of life" (cited in Adeola, 1998, p. 343). Consequently, it may be argued that environmental concern, at least at any meaningful level, could be found only among those upper middle class and postmaterialists, and globally, only among Western industrialized countries (Brechin, 1999).

The postmaterialism thesis has not, however, been consistently supported. For example, while Skrentny (1989) found that social bases of environmental concern were similar across five industrialized nations including Austria, Australia, Great Britain, the United States, and West Germany (cited in Adeola, 1998), a number of studies have not supported the postmaterialism thesis. Dunlap, Gallup, and Gullup (1993) found, for example, that people from both poor as well as rich countries were extremely concerned about the environment (cited in Brechin, 1999). Brechin (1999) has subsequently argued that environmental concern goes beyond the geographical boundaries of countries, and that the shift in values featured in postmaterialism could not explain why people are environmentally concerned. Similarly, Gooch's (1995) findings in three countries (Estonia, Latvia, and Sweden) with different levels of postmaterialism did not support the postmaterialism hypothesis, nor did Adeola's (1998) study, which found that the citizens of noncore countries demonstrate a higher degree of environmental consciousness, and are, in fact, actually more concerned about the environment. More recently, Kemmelmeier, Król and Kim (2002) found that postmateralist values do not mediate the relationship between economic conditions and proenvironmental attitudes based on the data of 22 societies provided by the 1993 International Social Survey Programme (ISSP).

In terms of China, the 1990-1991 World Values surveys indicate that it had higher levels of pollution concern but relatively few postmaterialists (Brechin, 1999). According to the survey, 52% of respondents supported environmental protection in China, which was 12% higher than the United States and 10% higher than Canada (Brechin, 1999).

Another study also found that Chinese people are, in fact, not as environmentally apathetic as has previously been thought. Specifically, out of a maximum score of 1.0, their reported mean ecological affect score was 0.80, which was greater than that of Americans (Benton, 1994; cited in Chan, 2001). However, it should also be noted that, while the Chinese appear to be genuinely concerned about addressing domestic environmental problems, there also seems to be little internal interest in dealing with international problems such as global warming (Bardeen, 1995).

This variation across countries may be due to different value systems and dissimilar worldviews, which in turn, have a significant influence on how individuals assess environmental threats to health and well-being on a practical level (Vaughan & Nordenstam, 1991). Some theorists argued that "values, rather than economic status, are most critical in shaping environmental attitudes and behavior" (Kemmelmeier et al., 2002, p. 258). For instance, according to Schultz and Zelezny (1998), proenvironmental attitudes are closely related to self-transcendence values (cited in Kemmelmeier et al., 2002). Thus, major cross-cultural differences in environmental attitudes, levels of concern, activism, and pro- environmental behavior between the North and South, the poor and the wealthier countries, does seem to exist (Adeola, 1998).

Based on the above, it appears that the man-nature value orientation and the relational orientation concepts, as examined and argued by Chin (2001), are more appropriate than the postmaterialism concept in terms of explaining varied attitudes toward the environment. It should be noted, however, that any examination of value similarities and differences between two countries such as China and Canada must be treated cautiously when the results are used to compare the values and attitudes held by

Chinese in Canada with those held by Canadians. This is particularly true because, in the latter case, other factors such as acculturation may have had an effect on the traditional Chinese value systems held by immigrants. Thus, because there are currently no findings related to overseas Chinese environmental attitudes, especially with reference to the impact of acculturation, the following review of the literature draws upon study findings involving other racial and ethnic groups.

Ethnicity/Race and Environmental Concern

Much of previous research concerning environmental concern reflects the opinions of the White majority. It is widely held that Blacks and other people of color are not concerned about the environment (Jones, 1998). However, Jones and Carter (1994) and Jones (1998) analyzed the history background and previous empirical findings regarding environmental concern of Blacks and other people of color, and concluded that there is very little research to support this claim. Based on a thorough examination of past findings, they proposed the following four hypotheses: Whites only; economic contingency; concern gap; and social priority.

Whites only Hypothesis

Blacks and other people of color are not interested in environmental issues and therefore are not concerned with the environment. This view was the origin for the finding that historically few minority members were involved in environmental activism. However, the evidence suggests that environmental protection is a strong and enduring concern for most Americans, regardless of race. According to Mitchell (1980), the difference between Whites and Blacks is that Whites were found to be more sympathetic toward, and more active in, the environmental movement while Blacks were much more concerned than

Whites with specific environmental problems such as water and noise (cited in Jones & Cater, 1994). Similarly, Cutter (1981) found that Blacks who lived near solid waster disposal sites were more concerned about environmental pollution (cited in Jones & Cater, 1994). Past studies (Rudzitis, 1982; Roper Organization, 1983) have also found that Blacks or people of color tended to be more supportive of economic development and resource exploitation than Whites if doing this meant more benefits or jobs (cited in Jones & Cater, 1994). In turn, if protection of environment or control of economic growth implied potential loss of job or benefits, Blacks or people of color (such as Hispanics) showed less support than did Whites (Connerly, 1986; cited in Jones & Cater, 1994). Unfortunately, in the above studies, Jones and Cater (1994) and Jones (1998) did not mention whether or not "people of color" included Asian minorities.

Economic Contingency Hypothesis

This hypothesis implies that economic goals, relative to environmental quality goals, especially during economic crises, are of higher priority (Buttel, 1975; Jones & Dunlap, 1992; cited in Adeola, 1998). Stated another way, during difficult economic periods, economically vulnerable groups--including people of color such as Chinese in Canada and Chinese Canadians--would be less likely to support environmental protection than economically advantaged groups such as White or Anglo-Canadians.

Concern Gap Hypothesis

Blacks do not have as much concern about environmental problems as Whites. Although research conducted in the late 1960s and early 1970s found that Blacks were not as concerned about environmental problems as Whites, this may have been because environmental protection was often aimed at protecting wilderness and other aesthetic values--a major issue for Whites--while toxic wastes and other health threats from pollution--a major issue for Blacks--was not being examined. Since 1980, however, it appears that Blacks and people of color tend to care about the environment more than Whites do, most likely because: "blacks and other minorities are historically disproportionately burdened by environmental hazards" (Mohai, 1990, p. 744). For example, research indicates that Blacks and people of color tend to be understandably more concerned about immediate and forthcoming environmental problems such as nuclear power, solid, toxic, and nuclear waste, whereas Whites are more likely to care about the environment at a macro-level, and therefore, are more focused on issues such as global warming, biodiversity, and ozone depletion. This finding has lead Taylor (1989) to concluded that the "concern gap is a function of one or more social, economical, psychological, cultural, historical, or measurement factors" (p. 192). Having stated this, it is important to recognize, however, that African Americans are not a homogeneous subgroup and that environmental concern is not a homogeneous attitude (Sheppard, 1995; Van Liere & Dunlap, 1980). Thus, the existence of any concern gap may, in fact, be more a result of measurement issues and less the result of any real difference in environmental concern (Sheppard, 1995).

Social Priority Hypothesis

According to this hypothesis, Blacks place higher priority on social concerns than environmental concerns compared to Whites because they are often positioned in lower social status with low income, and hence, they are more concerned about social well-being than environmental problems. Therefore, relative environmental concern would better reveal the difference between Whites and Blacks. For example, Jones and Cater

(1994) examined relative environmental concern using data from a series of General Social Surveys conducted from 1973 to 1990 by The National Opinion Research Center (NORC). Their findings indicate that in all but one year (i.e., 1982), Whites placed significantly higher priority on environmental protection than Blacks relative to the other seven domestics programs examined in the Surveys. In a separate study, Sheppard (1995) has reported a similar pattern.

Acculturation and Environmental Concern

In terms of cultural influence on environmental concern, previous studies have mostly focused on comparisons between or among individual countries (e.g., Adeola, 1998; Bechtel, Verdugo, & De Queiroz Pinheiro, 1999; Corral-Verdugo & Armendariz, 2000; Furman, 1998; Gooch, 1995; Pierce, Lovrich, Jr, Tsurutani, & Abe, 1987; Schultz & Zelezny, 1998). However, very few of these studies examined how acculturation may have influenced immigrants' views toward the environment. In contrast, some intra-national studies have included acculturation as a variable, with Caro and Ewert (1995) stating that environmental concern may be influenced to a greater degree by level of acculturation than by ethnicity. Unfortunately, however, few studies can be found in the research literature related to acculturation and environmental concern besides the work done by Caro and Ewert (1995), Noe and Snow (1989), Schultz et al. (2000), and Synodinos (1990).

Specifically, Caro and Ewert (1995) used two variables--place of birth and age of arrival, as elements of an acculturation measure in order to examine the effect of acculturation on environmental issues. They found that a person's level of acculturation "accounted for most of the observed variation in [his or her] environmental concern" (p.

13). Unfortunately, however, this conclusion was reached without considering the effects of other variables such as income and education. Similarly, Schultz et al. (2000) examined the environmental attitudes of foreign-born Latinos Americans and how these differences in attitudes were affected by acculturation. They found that acculturation was negatively related to scores on the NEP scale, and that this held true even when income and education were kept constant. Schultz and Unipan concluded that acculturation is an important determinant of environmental attitudes.

A third study which included acculturation was conducted by Noe and Snow (1989). In this study two surveys were distributed in Florida to determine whether differences in ethnic background influenced preferences toward the environment. In a general population survey, Hispanics showed three-dimensional ecological orientation to nature (anthropocentrically dominated, ecologically dominated, and earth-limit dominated) and were found to be more supportive of anti-anthropocentric attitudes than were non-Hispanics. While in a field survey, Hispanics who were more likely to be park users and boaters, showed two-dimensional ecological orientations to nature (anthropocentrically dominated and ecologically dominated), and shared similar ecological views to those non-Hispanics. This sharp contrast between Hispanics who were park users and boaters and those who were not necessarily park visitors, according to Noe and Snow (1989), indicated that "something has obviously influenced the Hispanic respondents who use the bay and the park...they may be part of an acculturation process" (p. 31). Although the researchers did not examine this relationship further, their statement implies that Hispanics who have achieved economic success (a proxy for a high level of acculturation) exhibited attitudes more consistent with the non-Hispanic perspective.

Finally, in a fourth study, Synodinos (1990) examined environmental attitudes and knowledge among five groups of college students: Americans of Caucasian ancestry, Americans of Chinese ancestry, Americans of Japanese ancestry, Americans of other ancestry, and non-U.S. citizens. The study's results suggest that the Caucasian students were significantly different from all of the other groups, while Americans of Chinese ancestry and Americans of Japanese ancestry were the most similar. Although the investigator did not explore the cultural aspects of these two groups, it can probably be assumed that they shared similar cultural roots. Synodinos also examined the relationship of length of residence in the United States among three-group-non-U.S. students and how this affected their environmental attitudes and knowledge. The results indicate that the three subgroups were not significantly different from one another in their attitudes toward the environment and their environmental knowledge. Thus, this finding does not support the proposition that foreign students increase their environmental knowledge as they spend more time in the United States.

Summary and Conclusion

As reported above, there appears to be a lack of consistency in how culture and acculturation affect environmental concern. To a large degree, this outcome is a result of five factors. First, the definition and conceptualization of the term environment is inadequate. Conceptually, the environment can range from the very local to the global. Environment can also refer to biophysical or natural world, physical and social territory, and spatial and psychological surroundings and circumstances (Gooch, 1995). Moreover, differences in the natural environment and the living environment are not always defined in studies of environmental beliefs and attitudes despite the fact that these differences are essential for understanding the causes of environmental concern (Gooch, 1995). It is obvious that the choice of concept and indicators of environmental attitudes can strongly influence research results and the ensuing inferences (Van Liere & Dunlap, 1981; cited in Kuhn & Jackson, 1989). According to Jones and Cater (1994), if environmental concern is narrowed to only imply environmental impacts related to air, water, land, and species other than *Homo sapiens*, then critical impacts to the cultural and socio-structural systems are being ignored.

The second factor involves issues associated with measurement. For example, most of the previous studies indicated that attitudes were measured at a general, abstract and symbolic level that led to little observed variance in concern. Vaughan and Nordenstam (1991) stressed that "differences in the breadth of the construct measured could lead to apparent inconsistencies when comparisons are made across studies and among ethnic groups" (p. 29). Indeed, environmental concern, when it arose, was not abstract, but concomitant with a specific group's self-interest. Thus, studies of attitudes need to focus on more local and specific environmental issues so that the variation in environmental attitudes can be effectively revealed (Brechin, 1999; Jones, 1998; Van Liere & Dunlap, 1980). In terms of research concerning comparisons of environmental perspectives of racial groups, Caron (1989) suggested that measurements of both broad or symbolic environmental orientations (such as endorsement of the NEP), as well as attitudes toward specific environmental problems (such as loss of wilderness, wildlife, and toxic waste contamination) should be considered. Comparisons in this manner could potentially contribute to a better understanding of how racial groups agree and disagree about environmental issues (Caron, 1989).

The third factor involves issues associated with scale use. One source of confusion concerning the relationship between environmental concern and various independent variables is the use of different scales by different authors to measure environmental concern and/or environmental knowledge (Furman, 1998). For example, in the case of environmental attitudes, the NEP measures only the belief about outcomes component, whereas the Environmental Concern (EC; R. Weigel & J. Weigel, 1978) and the Awareness of Consequences (AC; Stern et al., 1993) measure both the belief and evaluative dimensions of attitudes (cited in Tarrant & Cordell, 1997). To remedy this problem, Tarrant and Green (1999) suggest using multiple scales as an alternative approach.

The fourth factor involves issues associated with the target population. Most research on the socio-demographic characteristics of environmental activists is limited to environmental organization members in the mainstream society (Freudenberg & Steinsapir, 1992, cited in Jones, 1998). Significantly less research has been done with minorities and working class people as target populations (Jones, 1998), as Black's and other minorities' concern about the environment has not been the primary focus of most previous studies. Moreover, little attempt has been made to oversample smaller minority populations in the general population which, in turn, has lead to low reliability in the data and to conflicting findings (Mohai, 1990).

The fifth and final factor involves issues associated with the choice of independent variables. The inclusion of different independent variables in different studies could, potentially, result in different findings. Theoretically, both social structural and social psychological variables should be included in examining environmental concern (Dietz et al., 1998). However, according to Dietz and Stern, "little has been done to test models that integrate theory about the social structure and the social psychological bases of environmental concern" (p. 450).

Despite the inconsistent findings in past studies, some general tendencies can nevertheless be identified. First, people tend to be more concerned with local environmental problems relative to the general environmental issues; this is particularly true for Blacks and other people of colour as well as for members of the working class. Second, social structural variables such as age, education, and income to some extent are related to environmental concern; however, the strength of these relationships is often small and/or insignificant. Third, compared to the slight effect social structural variables have on environmental concern, the cultural values held by a society or a minority group appears to have a significant bearing on environmental concern. Finally, environmental values and attitudes held by immigrants might also be subject to changes as a result of acculturation.

In conclusion, because attitudes are influenced by values, and values are a key element in defining and describing ethnic and cultural groups, it would seem that an examination of environmental attitudes from the socio-psychological perspective might function more effectively than from the socio-structural perspective when a cross-culture comparison is involved. More specifically, in terms of a cross-cultural comparison between a majority society, such as Anglo-Canadians, and a minority group, such as Chinese in Canada, the influence of acculturation on both environmental values and attitudes is a critical factor that must also be taken into account. Based on the above propositions, therefore, this study will examine the effect of acculturation on environmental values and attitudes and, because of the paucity of research in this area, will hopefully contribute to an understanding of how environmental attitudes may change over time.

Leisure and Leisure Attitudes

In this section of the literature review, the Western/Canadian views of leisure in general and leisure attitudes in particular will be first examined. Followed by that, how leisure and leisure attitudes differ in Chinese culture, as well as the effect acculturation may have on these two concepts will be compared and discussed.

Leisure From a Western/Canadian Perspective

Defining leisure has always been problematic (Mannell & Kleiber, 1997). In the past, philosophers, sociologists, anthropologists, psychologists, and economists have tried to define leisure from their own specific disciplinary perspectives. However, although no universally agreed upon definition of what leisure is currently exists, many leisure scholars (e.g., Godbey, 1994; Mannell & Kleiber, 1997; Neulinger & Breit, 1969, 1971) contend that it involves at least one or more of the following: (a) free time, (b) activity, and (c) a state of existence or state of mind.

Leisure as Time

Leisure is most commonly regarded as free or discretionary time. That is, time that is free from obligations such as biological function maintenance (i.e., eating, sleeping), paid work, or work-related responsibilities. This view of leisure primarily results from the Industrial Revolution in which lives were segmented into work time and free time (Edginton, Jordan, DeGraaf, & Edginton, 1998). The key point here is that leisure is considered as time "at one's own disposal" (Russell, 1996, p. 32, cited in Edginton et al.

1998, p. 36) for rest or a choice of activity. According to Brightbill, "no matter how one tries to modify the concept of leisure, *time* is its essence. Leisure can no more be divorced from the element of time than it can be completely separated from the function of work. Ultimately, leisure must be identified with the *when* quite as much, if not more than, the *how*" (1960, p. 4, cited in Yeh, 1993, p. 6).

The problem with defining leisure as free time is that, in most people's daily lives, "it is particularly difficult to determine what is free time and what is not" (Godbey, 1994, p. 3). Moreover, in Western society, most free time is indirectly related to obligations, work, or work- related responsibilities, as indicated by Kraus' (2001) statement that, "the strict view of leisure as time that lacks any obligation or compulsion is suspect" (p. 34). In some circumstances, for example, leisure experiences are constrained by lack of resources, choices, and abilities even if discretionary time is available (Searle & Brayley, 1993). Furthermore, for those who are retired, unemployed, or homeless, the idea of leisure as free time seems to have no meaning. In this sense, free time is "a necessary but insufficient condition for 'leisure' to take place" (Godbey, 1994, p. 5), and, therefore "leisure and free time are not synonymous" (Iso-Ahola, 1999, p. 36).

Leisure as Activity

Time and activities are concomitant and inseparable. More accurately, leisure as time is leisure as use of time. The term "*schole*", the ancient Greek word for leisure, means "serious activity without the pressure of necessity" (Goodman, 1965, cited in Godbey, 1994, p. 4). Therefore, leisure is always defined in terms of certain clusters of activities. Dumazedier (1960) broadened the concept of leisure as activity to include "a number of occupations in which the individual may indulge or improve his own free will--either to rest, to amuse himself, to add to his knowledge or improve his skills disinterestedly or to increase his voluntary participation in the life of the community after discharging his professional, family, and social duties" (cited in Godbey, 1994, p. 4). This definition of leisure as activity implies that leisure occurs in a real, external world, and can be experienced by the many, rather than in a utopian realm that is beyond worldly concerns, and can only be experienced by the few (cf. De Grazia, 1964). It is important to note, however, that leisure as activity does not mean that all activities can be classified as leisure, nor does it mean that the same activity will be viewed by everybody as leisure.

Leisure as State of Existence or State of Mind

The classic view of leisure, according to Aristotle, is to regard leisure as "a state of being in which activity is performed for its own sake" (cited in Kraus, 2001, p. 32). This understanding of leisure emphasizes the intrinsic values of leisure, implying that leisure is characterized by calmness, quietness, and contemplativeness. This view of leisure also treats it "as a state of being free from the requirements of work" (Searle & Brayley, 1993, p. 33). Therefore, in ancient Greece, leisure was largely limited to the aristocrats and members of the upper class.

Even in today's society, leisure pursued as a state of being is "unlikely to be available to many." (Searle & Brayley, 1993, p. 34). Instead, for the general public leisure is a means by which pressures accumulated from work may be released, and therefore it is not separate from work, but rather it has meaningful relationship to work. Moreover, for some people, leisure means work and vice versa, and "what is work to one person may be leisure to another, and vice versa" (Edginton et al., 1998, p. 41).

Leisure defined as a state of being suggests that leisure is a subjective experience that involves the perception of freedom (Searle & Brayley, 1993). According to Neulinger (1974), for example, "leisure has one and only one essential criterion, and that is the condition of perceived freedom. Any activity carried out freely, without constraint or compulsion, may be considered to be leisure. To leisure implies being engaged in an activity as a free agent and of one's own choice" (cited in Goodbey, 1994, p. 5). This definition of leisure has subsequently been widened by Iso-Ahola (1980) and others (Mannell & Kleiber, 1997) such that the state of mind conceptualization is now characterized by four factors: (a) freedom of choice, (b) source of motivation (intrinsic or extrinsic), (c) relationship to work, and (d) goal orientation (Searle & Brayley, 1993, p. 34). In summary, while leisure as a state of being, emphasizes the internal world of Aristolean upper class, leisure as a state of mind centers on the subjective experience of ordinary individuals.

As noted earlier, trying to define leisure in terms of only time, or activity, or experience is inadequate because leisure involves all three of these elements. For example, most people choose to take part in preferred activities during their perceived free time in order to attain desirable experiences. Thus, free time is the necessary condition for an activity to take place, while experience is the terminal result an individual seeks during the process of leisure.

It is important to recognize, however, that the aforementioned conceptualizations of leisure are largely based on research conducted in Western societies, and, therefore, may not apply to other cultures (Mannell & Kleiber, 1997; Searle & Brayley, 1993). A cross-cultural examination of the meaning of leisure may provide a different definition of leisure in a non-Western society or in a group having a non-Western cultural background. In addition, because concepts such as free time, freely chosen activity, and state of being "all suggest that the leisure experience is largely defined by a participant's subjective attitudes" (Crandall, 1979, p. 170), a cross-cultural examination of attitudes towards leisure could advance an understanding of how leisure is valued and perceived by different societies. Based on this proposition, therefore, the remainder of this section focuses on Western/Canadian and non-Western attitudes toward leisure.

Leisure Attitudes

Among leisure researchers, agreement on what constitutes a leisure attitude is lacking. For example, Iso-Ahola (1980) defined a leisure attitude "as the expressed amount of affect toward a given leisure-related object" (p. 251), thereby emphasizing the affective aspect of leisure. In contrast, Langenhove (1992) proposed that, "what people think of leisure in general can be regarded as a belief-system or as a set of attitudes"(p. 149). Thus, by defining a leisure attitude this way, Langenhove stressed the cognitive aspect of leisure. Finally, according to Ragheb and Beard (1982) all three components of an attitude--that is, the cognitive, affective, and behavioral--must be considered when examining a leisure attitude.

Leisure attitudes are varied and diverse. For example, "is idleness really the devil's workshop?" Or "is bungee jumping a safe and worthwhile leisure pursuit" (Mannell & Kleiber, 1997, pp. 336-337)? Moreover, "is it really a big problem if African Americans don't go camping in the National Parks" (Philipp, 2000, p. 121)? Because of this diversity, attitudes toward various aspect of leisure are initially examined from a historical perspective and then based on recent empirical findings.

Leisure Attitudes from a Historical Perspective

In Western society, people's attitudes toward leisure have varied during different time periods. The dominant cultural ideal, inherited from ancient Greece, of seeing leisure as the opposite of work, and "allowing freedom for 'higher' activities" (Sylvester, 1999, p. 17), has evolved to become hardly detectable among people in today's society, while "[the] ethic of work persists today" (Sylvester, 1999, p. 17).

In ancient Greece, leisure was highly valued by, and pursued among, aristocrats and the superior class of citizens. For them, leisure was the condition of good life, the source of happiness, and was synonymous with the arts and philosophy. In contrast, work, performed by people in the lower classes, was less valued, and was widely regarded as a detriment to intellectual development.

This attitude, however, changed during the Roman period, since Roman "leisure pursuits and activities tended to be much more utilitarian than [those] in Greek society" (Edginton et al., 1998, p. 60). As a consequence, leisure became secondary to work, and when it was engaged in it was seen as a way to relax and escape the pressures of work, rather than something to be pursued for its own sake. In addition, because leisure activities during this period of time were often viewed by later historians as "being hedonistic, vulgar, and corrupt" (Edginton et al., 1998, p. 61), "application of [the word] 'leisure' provoked the formulation of negative attitudes toward all things 'recreational'" (Yeh, 1993, p. 14).

This negative attitude toward leisure has remained more or less unchanged since Roman times (Yeh, 1993), although some Renaissance men did adopt an Aristolean view of leisure. The adoption of the Greek ideal, however, did not prevail due to the emergence of a new worldview in the West--that is, the Protestant work ethic. With this new ethic, work was emphasized and seen as central to the good life, while the classical leisure rooted in Greek philosophy was either looked down upon as idleness, uselessness, and unproductiveness or as only a means of refuelling energy for work (Sylvester, 1999). This work ethic had a significant impact on attitudes and values toward work and leisure in North American societies both during the colonial times when leisure was not highly prized in the United States and Canada (Ibrahim, 1991, as cited in Searle & Brayley, 1993) and even in today's society. According to Ibrahim (1991), "pursuit of happiness in colonial life was secondary to pursuit of the new political and economic system" (cited in Searle & Brayley, 1993, p. 163).

The Protestant work ethic became even more predominant during the Enlightenment when people began to focus on meeting often insatiable material desires which could only be assuaged by even more assiduous work. As a consequence, "as Capitalism developed and spread throughout the Western world, the Classical ideal of leisure and happiness retreated and finally disappeared or became a nostalgic motif remembered by an extremely limited few" (Yeh, 1993, p. 18).

Although elements of the Protestant work ethic remain in Western society, awareness of the important role that leisure plays in people's lives has grown since World War II (Yeh, 1993). During these past decades, the United States and Canada have entered the technological or information, era, and, consequently, "leisure [has been] increasingly viewed as an end in itself" and "every life experience presents opportunities for leisure" (Edginton et al., 1998, p. 87).

In conclusion, people's attitudes toward leisure and the way leisure is pursued have been subject to the social, economic, and political development of different eras as analyzed above. Before the Industrial Revolution, leisure pursuits were not as diversified and often were limited to those deemed to have intrinsic value. In contrast, in modern times, leisure is no longer a privilege of the few; instead, it is recognized as one of the basic human rights (American Association of Health, Physical Education and Recreation, 1970, cited in Neulinger & Raps, 1972). It is important to note, however, that while industrialization and technology have emancipated many workers from laboring, work routines are found boring by many. On the one hand, the use of machines enhances working efficiency and hence more time seems to be available, on the other hand, people's working pace and life pace are more hectic than ever before, and free time is, therefore, precious.

The above examination of attitudes toward leisure is a broad analysis of people's perception of leisure as a whole. Leisure studies as a new discipline only occurred around 1960. Consequently, an understanding of what people thought of leisure before that time period, especially before the Industry Revolution, is largely based on the ideas of few aristocratic philosophers, who may not represent the thinking of the general public (Sylvester, 1999). In a more dynamic and diversified society, people's attitudes toward leisure will not be one-dimensional and linear, and are likely to be as various as people's understanding of what leisure is.

It is only since the 1960s that the leisure attitudes of the general public began to receive attention by leisure researchers. In the 1970s and 1980s, research in this regard largely focused on the development of leisure attitude measures. However, in the 1990s, researchers began to pay more attention to how leisure attitudes are related to other aspects of leisure such as motivation and satisfaction. While leisure attitudes are recognized as having impacts on leisure behavior and experience, "only a limited amount of research has been done on leisure attitudes" (Mannell & Kleiber, 1997, p. 336). In view of this perceived research gap, the key empirical findings in this regard will be reviewed in the following section.

Empirical Research on Leisure Attitudes

During the 1970s and 1980s leisure scientists primarily focused on the development of leisure attitude measures. In order to examine what people think about leisure, four measurement techniques have been developed, including those by Burdge (1961), Neulinger and Breit (1969, 1971), Crandall and Slivken (1980), and Ragheb and Beard (1982). Of these four, the Leisure Attitude Scale developed by Ragheb and Beard (1982) is the most soundly conceptualized and hence has been the most widely used (e.g., Nichols & Fines, 1995; Ostiguy & Hopp, 1995; Ragheb & Tate, 1993; Siegenthaler & O'Dell, 2000). A detailed analysis and comparison of the strengths and weaknesses of these different scales will be presented in the next section: Research Methods. However, in this section some of the more important empirical findings relating to leisure attitudes, which have been largely dependent on the use of these four scales, will be examined.

As leisure attitudes are complex, dynamic, and multidimensional, no single research study can explain what all leisure attitudes are about. Previous studies have focused on understanding some specific attributes of leisure attitudes within a particular population. Findings from a selected number of these studies provide some understanding about the formation of leisure attitudes, relationships of leisure attitudes to other aspects of leisure domains such as leisure motivation, satisfaction, and participation, correlations of leisure attitudes with socioeconomic and demographic variables, and cross-cultural comparison of leisure attitudes. The main findings from key leisure attitude studies follow.

Formation of leisure attitudes. According to Hall and Rhyne (1989), "some values and attitudes towards leisure are formed quite early" (p. 31). Potentially, this formation may be a function of family relationships. For example, the formation of leisure attitudes is associated with family dyads, as indicated by Siegenthaler and O'Dell (2000). Based on interdependence theory, which "posits that the heart of social interaction occurs in dyadic relationships" (Gonzalez & Griffin, 1977; Rusbult & Arriaga, 1997; cited in Siegenthaler & O'Dell, p. 282), Siegenthaler and O'Dell (2000) examined leisure attitudes among college students (most of whom were Anglos). The results showed that parents had the most significant effect on the formation of their children' leisure attitudes.

The formation of leisure attitudes may also be influenced by historical conditions. For instance, Blacks' underparticipation in wilderness may be more a matter of cultural attitude than lack of access. For them, wilderness is a place of White dominance and Black suppression (Hall & Rhyne, 1989), and hence, it is not a place to go. If so, the long history of discrimination against Blacks could also contribute to form attitudes toward leisure such that certain types of leisure are associated with Whites. Corollary to this is that Blacks see no need to become involved in an activity or visiting a setting dominated by Whites. This type of leisure attitude may be passed on from parents to their children generation by generation (Philipp, 1999). The formation of leisure attitudes of this kind and its relationship to leisure activities and locations, according to Philipp (1999), could be considered as a separate conceptual framework used to explain Blacks' leisure behaviors beyond the stereotypical marginality/ethnic theses.

Relationships of leisure attitudes to other aspects of the leisure domain. Research on the relationships among leisure attitude, motivation, satisfaction, and participation began in the early 1970s, and has continued to be studied by researchers throughout the 1990s. Previous studies have found that leisure attiutdes were positively related to leisure participation and satisfication.

For example, Christensen and Yoesting (1973) examined the effect of socio-economic and demographic variables, as well as leisure attitudes, on the use of outdoor recreational facilities. They found that leisure attitudes had a greater contributory effect than income on the level of participation in outdoor recreation. Crandall (1979) examined people's leisure attitudes in terms of their feelings about: (a) total leisure, (b) social leisure, (c) outdoor and recreational facilities, (d) entertainment media, and (e) amount of time and income. Crandall found that general attitudes toward leisure are significantly related to leisure activities involving social interactions. Ragheb (1980) examined the interrelationships among leisure participation, leisure satisfaction, and leisure attitudes. He found that leisure satisfaction has a much stronger effect than leisure attitudes on leisure participation. In addition, leisure attitudes and satisfaction were found to be positively related. In two more complex studies, Ragheb and Tate (1993) and Hsieh (1998) developed a path model to examine causal relationships among leisure attitudes, motivation, satisfaction, and participation. Both studies found that the cognitive and affective components of leisure attitudes, as measured by the Leisure Attitude Scale (Ragheb & Beard, 1982), differed in the degree of effect each had on motivation, with the latter having the greater significance than the former. However, the two studies differ considerably regarding the effect of leisure attitudes on leisure satisfaction. For instance, Ragheb and Tate's (1993) finding indicates that leisure attitudes have consistently positive effect on satisfaction. In contrast, in Hsieh's (1998) study, leisure attitudes were found to have direct significant negative effect on leisure satisfaction (for detailed discussion on the dissonance in this regard, see Hsieh, 1998, pp. 92-93). In spite of this inconsistency, both studies endorse Ragheb and Beard's (1982) argument that the inclusion of leisure attitudes as a variable should be selective among its three components.

Finally, not only do leisure attitudes have an effect on leisure participation, but leisure participation can also influence leisure attitudes. For example, Nichols and Fines's (1995) research on outdoor adventure activities indicates that leisure attitudes measured by the Leisure Attitude Scale (Ragheb & Beard, 1982) were enhanced positively after participating in outdoor adventure activities. The mean scores of the two components of leisure attitudes measured--affective and behavioral--were significantly different between the pre- and post-test. However, the increase in the mean score for the cognitive component was insignificant before and after participation.

Correlations between leisure attitudes and socio-demographic variables. Leisure attitudes have also been examined in relation to other demographic variables such as sex, age, education, and income. Ragheb and Beard (1982) found that correlations between leisure attitudes and demographic variables are generally small but statistically significant. In general, the cognitive component has a positive relationship with age, education, and income, while the affective and behavioral components exhibit negative relationships. Ragheb and Beard also found that males tended to have more positive leisure attitudes than females in terms of the cognitive and affective dimensions of leisure attitude. This result conflicts with Neulinger and Breit's (1969) findings (which were based on a different version of the leisure attitude measurement scale developed by Neulinger and Breit, 1969) in that males indicated greater job role than females, and the importance and value of leisure were valued lower by males than by females.

Socio-economic and demographic variables have also been examined along with the participant's ethnic background. Chesnutt (1983) examined the impact of culture, sex, age, marital status, and their interactions on the affective component of leisure attitudes among three cultural groups located in Montgomery, Alabama, Duluth, Minnestota, and Saskatoon, Saskatchewan. Chesnutt found that unmarried males had significantly higher affective scores than did married males, whereas there was no significant variation in terms of affective leisure attitude between married and unmarried women. One important finding from this research is that occupation, income, education, and religious preference had no impact on leisure attitudes. In contrast, Burdge (1961) found that social status was positively related to leisure orientation. Neulinger and Raps (1972) also found social and economic status as well as religious preferences have significant effect on most of the five dimensions of leisure attitudes (Neulinger & Breit, 1969) such as affinity for leisure, society's role in leisure planning, self-definition through leisure or work, amount of leisure perceived, and amount of work versus vacation desired. Inferred from their findings, members of the upper class tended to adopt the view of the ancient Aristotelians, and have more positive attitude toward leisure than did members of the working class.

Cross cultural comparison of leisure attitudes. Jackson (1973) conducted an interesting and innovative research study which examined the relationship between value orientations and leisure attitudes while including the variables of socio-economic status and ethnic background. His work is possibly the first to investigate leisure attitudes cross-culturally, based on the theoretical premise that cultural subgroups with dissimilar value orientations would exhibit differences in certain dimensions of leisure attitudes. Value orientations and leisure attitudes were examined among four groups: Anglo teachers, Anglo custodians, Mexican-American teachers, and Mexican-American custodians. While all four groups "expressed a degree of residual commitment to the Protestant work ethic" (p. 20), generally, Mexican Americans tended to be more positive toward leisure than Anglos who exhibited greater orientation toward work, likely reflecting the traditional work ethic found in Anglo culture. Variations among the same subgroup were also found. For instance, Mexican-American custodians, representing lower levels of status, education, and income, valued leisure less than their teacher counterparts, who represented the higher levels of social class. This finding may support the notion that leisure is usually a pursuit of upper or middle class members, regardless of the interaction effect of ethnic background.

Chesnutt's (1983) examination of cultural impact on leisure attitude indicated that culture had a slight to moderate role on leisure attitude between groups. Specifically, no significant difference was found between the Canadian group and either of the two American groups. According to the author, these findings are probably due to small sample sizes and greater similarities between two cultures. Relatively, a smaller difference was found between the two USA groups, whereas respondents from Duluth, Minnesota exhibited higher behavioral attitudes than did the respondents from Montgomery, Alabama. Probably, the existence of a stronger Protestant work ethic in Montgomery compared with Duluth is the reason for this slight difference in leisure attitudes.

Hall and Rhyne (1989) conducted a comprehensive comparison study among 17 of Ontario's ethnocultural groups with regard to leisure participation patterns, barriers to participation, leisure satisfaction, leisure values, leisure motivations, and leisure needs. In terms of leisure values, measured by the Leisure Attitude Scale developed by Crandall and Slivken (1980), they found that Chinese, along with other groups such as Portuguese, South Asian, and West Indian "placed less value on having leisure time available to them" with Chinese emphasizing this the least, while the British, Jewish, and Scandinavian groups placed significantly higher values on leisure than the others, with Jewish emphasizing the leisure the most. In terms of leisure quantity desire, measured using the same scale, groups such as the British, Dutch, and South Central European have significantly less desire for leisure than the others, while the West Indian, French, Italian, and Ukrainian have the highest desire.

The above examination of leisure attitudes is from a general rather than a specific perspective. For example, in a study examining the importance African American and European Americans placed on some specific leisure activities, Philipp (1999) found that middle-class African Americans, when thinking of themselves as parents, viewed more leisure activities as being significantly less important than did their European American counterparts. The explanations for this, according to Philipp's, may partially be due to the sub-cultural traditions or values that African Americans hold toward leisure activities.

In terms of the meanings of leisure perceived by different cultural groups, Searle and Brayley (1999) argued that "there are words which may be thought of as having a common definition yet, when tested among a diverse population, may prove to carry many different meanings…Herein lies the challenge of searching for a clear and widely accepted definition and conceptualization of leisure" (p. 32). In response to this issue, Lee, Oh, and Shim (2000) examined the conceptual difference in leisure between Americans (the authors did not mention whether they are Anglos or Euro-Americans) and Koreans. They found that significant differences existed in the perception of leisure between the two groups. For Americans, "work relation and affect were more highly related to leisure" (p. 149), whereas Koreans tended to define leisure more in terms of perceived freedom. These results suggest that the definition of leisure was subject to the demographic variables such as age and marital status. Their findings confirmed to some extent that perception of leisure varied between cultures.

Leisure and Chinese Culture

The previous discussion suggests that the concept of leisure is largely of Western origin. Generally, specific terms that exactly match "leisure" in non-Western languages do not occur (Chick, 1987, cited in Yeh, 1993). For example, at least six different Chinese terms have been used by leisure researchers. Specifically, the term leisure has been rendered variously in Chinese as: (a) *hsiao yao*[3] (逍遥, Yeh, 1993, p.iii; *Note*. [3]*hsiao yao* is the use of the Wade-Giles system of romanization), (b) *yulei* (娱乐), (c) *xiaoxian* (消闲) (Wong, 1994, p. 76), (d) *xianxia* (闲暇), (e) *kongxian*（空闲）(*Oxford advanced learner's dictionary of current English with Notes Chinese translation,* 1988), and (f)（休闲, Ma, 2000). Of these six terms, *xiuxian* (休闲) is the most widely used among both mainland Chinese scholars and ordinary citizens.

Although it seems indisputable that the conceptualization of, and attitudes toward, leisure varies across cultures, this does not necessarily mean that some commonalities may not be shared by most, if not all, cultures. For example, Yeh (1993), in his dissertation, argued that:

> …with a general understanding of the Chinese concept of *hsiao yao*, one may find that this concept is comparable to the western concept of leisure, especially in its classical sense, which implies freedom from (or the absence of) the necessity of being occupied…for many Chinese, *hsiao yao*, or leisure, can be attained by those who can enjoy the inner serenity that derives from being in harmony with Nature. (p. iii)

Similar to ancient Greece, where the Western concept of leisure was originally derived from, this classical sense of leisure is limited to the aristocrats and upper class of ancient China. This view of leisure prevailed in China for thousands of years and formed the backbone of traditional Chinese leisure culture. Leisure is a very important component of traditional Chinese culture, and is closely related to "philosophy, aesthetics, literature and the arts, and practices of health and wellness" (Gong, 1998; cited in Wang & Stringer, 2000, p. 35).

However, leisure pursuits were largely confined to those people of the upper social class such as feudal officials and literati before modern times (Ma, 1998). It wasn't until 1936, for example, that Neumeyer and Neumeyer (1936) observed that, "leisure among the common laborers is becoming a problem in China" (p. 290). Even in recent years, "the vast majority of the Chinese agricultural population hardly participate in any recreation and /or leisure activities at all" (Xiao, 1997, p. 362). Arguably, it is this class difference that leads to leisure being viewed by the general public in China as "idle hand" (*youshouhaoxian* 游手好闲) or "not to do the right thing" (*buwuzhengye* 不务正业). Verbally, "*xian*" (闲) refers to "free of obligation", while "*haoxian*" (好闲) refers to "seek to be free of obligation." Based on this literal translation, leisure conveys a derogatory connotation from the perspectives of traditional Chinese culture. This negative attitude toward leisure, however, has changed considerably in recent years due to the rapid economic development and increasing living standards in mainland China as well as due to the influence of globalization. According to Henderson (1999), "leisure pursuits once frowned upon or banned outright by the [Maoists] are in ever-increasing abundance" (p. xiv).

As addressed in the introductory section, Chinese people are less likely to view leisure as an important component of their lives compared with North Americans. The following section attempts to compare the distinct dimensions of leisure between Chinese culture and Western culture.

Wang and Stringer (2000) identified five distinct differences between Chinese and North American leisure based on the work done by Yu and Berryman (1996). These differences can be classified into three categories based on (1) importance of a work ethic; (2) the nature of leisure pursuits; and (3) importance of family involvement.

First, leisure is less recognized in China than in North America, because Chinese in general tend to have a stronger work ethic than North Americans (see also Xiao, 1997).

Second, Chinese tend to prefer quiet or passive leisure pursuits in comparison with North Americans. The reason for this may be traceable to the two characters "*xiuxian*" (休闲) that make up the Chinese word for "leisure". "x*iu*"(休) symbolizes "a person leaning against a tree for a rest" (Ma, 1998) while *"xian"* (闲) symbolizes "a tree inside a yard". Hence, the combination of "*xiuxian"* implies tranquility, closeness to nature, and being home-oriented. This explanation is consistent with leisure activities typically pursued by Chinese both in North America and China.

Hall and Rhyne (1989) found that "[Chinese living in Ontario] are significantly more active [in passive, home based leisure pursuits such as] watching television, playing or spending time with children, watching rented videotapes, visiting libraries and going to theatres or concerts" (p. 66), compared to Canadian and other ethnocultural groups. Zhang's (1996) findings also showed that the most often participated activities pre- and post- immigration among three subcultural groups (mainland China, Taiwan, and Hong Kong) are home/indoor oriented. Wang and Stringer (2000) endorsed these findings by stating that many Chinese people prefer to "read books, write poems, listen to music, and talk with their friends at home [rather] than to go out and recreate" (p. 35). This proposition is also consistent with recent findings, as evidenced by the first "National Survey of Chinese Reading Preference" ("Watching TV", 2000), that Chinese people spend most of their free time watching television, followed by reading. Even for outdoor recreation activities, Chinese are far less adventurous than their North American counterparts, while passive or appreciative activities such as scenic sightseeing are the most popular outdoor activities among the Chinese. For instance, in an internet survey conducted by the National Tourism Administration of China, approximately 46%, the largest proportion among respondents, reported that scenic sightseeing was their first priority (National Tourism Administration of China, 2001). This is the case for Chinese in Canada, too. For instance, Walker, Deng, and Dieser (2001) found that the most important activities reported by Chinese are viewing wildlife (23% vs. 15% of Euro-North Americans), and viewing scenery (17% vs. 3% of Euro-North Americans; p. 272).

Third, and finally, Chinese prefer to pursue leisure activities alone and are less likely to be with family members at leisure (Wang & Stringer, 2000, p. 36). Although Chinese culture is characterized by collectivism, Chinese people often prefer to spend leisure time alone rather than to socialize in groups. Freysinger and Chen (1993) found that 43 % of adult respondents residing in two cities (*Nanning* 南宁 and *Guilin* 桂林) in mainland China saw "by self" as the favorite activity in terms of social context, while 32% reported it as being second favorite. There could be at least two explanations for this finding. On the one hand, it is consistent with the passive pursuits as suggested by traditional Chinese Taoism. On the other, it could be due to the crowding conditions encountered in the daily lives of Chinese people whereas being alone is the best way for escaping this situation. In terms of leisure with family members, at least three explanations can be presumably used to illustrate why Chinese were less likely to be seen with family members at leisure, compared with their American counterparts. First, it is consistent with Confucianism's philosophy on family relationships (Freysinger & Chen, 1993) in which obedience and respect are emphasized. Hence, relationships and power among family members are not equal. Consequently, family members are less likely to be seen at leisure. Second, as leisure is traditionally looked down upon, playing with children as parents somewhat suggests encouraging their children to play. As education and achievement have been significantly emphasized by Chinese society, children should be supervised and encouraged to become good employees or scholars who "must maintain dignity and be diligent in his work" and "play had no benefits", according to Chinese tradition (Neumeyer & Neumeyer, 1936, p. 289). Third, when leisure is seen as an effective means by which family members can be unified emotionally and mentally, there may be less need for this in China than in Western society since family ties appear to be much more tenuous than is the case in China.

It is important to note that these characteristics relating to leisure attitudes and behaviors may change due to immediate contact with a newly adopted society. For instance, the leisure patterns of family members exhibited in China may change in a new environment such as Canada. For example, Hall and Rhyne (1989) found that [Chinese living in Ontario] are significantly more active in … playing or spending time with children…" (p. 66) than Canadian and other ethnic groups. Based on this proposition, the next section examines the relationship between leisure and acculturation.

Leisure and Acculturation

Leisure is regarded both as a means by which ethnic culture and identity can be maintained, and also as a way for immigrants to become integrated into the host culture and society. In this sense, leisure and acculturation are closely related.

As previously mentioned, most studies involving race and ethnicity have largely focused on leisure patterns and styles and not on leisure attitudes. Moreover, most of these studies have examined ethnic groups such as Hispanics, Africans, and Blacks, and the principal theories that have been developed (e.g., marginality/ethnicity thesis, acculturation/assimilation thesis, and discrimination thesis) are based on findings involving these minority groups. Among these theses, "the assimilation thesis may be particularly relevant to immigration trends" (Floyd, 2001, p. 47). Hence, a brief review of literature on acculturation and its effects on leisure/recreation behaviors of minority groups is necessary.

According to Floyd (2001), two types of assimilation have been studied in recreation research: cultural assimilation (acculturation) and structural assimilation. This thesis assumes that "greater assimilation leads to similarity between majority-and minority-group members" (Floyd, 2001, p. 46). "The degree of assimilation of a group is a meaningful factor to describe the effects in the type of their leisure constraints and recreation activities" (Juniu, 2000, p. 363). Recognizing this, a number of studies, including those focused on Chinese minority members, have used assimilation theory to examine ethnic patterns in leisure/recreation participation.

Carr and Williams (1993) examined influences of ancestral, generational, and acculturational differences on meanings and preferences associated with outdoor recreation experiences and forest use among three groups: Hispanics of Central American ancestry, Hispanics of Mexican ancestry, and Anglos. Results indicate that Hispanics with longer generational tenure and higher level of acculturation are more likely to have similar recreation styles to Anglos. Additionally, the Central American group, which had lower acculturation levels, tended to be more likely than Anglos to be in organized activities.

Floyd and Gramann (1993) examined the relationship of acculturation and structural assimilation of Mexican Americans to their outdoor recreation patterns by using an analytical framework derived from ethnic assimilation theory. Their findings show that the recreation behavior of highly assimilated Mexican Americans is more similar to Anglos than to less-assimilated counterparts. Furthermore, acculturation was found to affect participation patterns while primary structural assimilation affected site visitation.

Gramann, Floyd, and Saenz (1993) employed an approach based on ethnic-assimilation theory and concept of "selective acculturation" to examine the similarities and differences in 13 outdoor recreation benefits between Mexican Americans with different levels of acculturation and Anglos. The findings indicate that an Anglo-conformity pattern occurs with some recreational benefits. However, familism among the most established Mexican Americans is rated higher than Anglos, suggesting a process of selective acculturation. In addition, benefits varied substantially in importance between acculturation groups.

Shaull and Gramann (1998) investigated the differences in the reported importance of family-related and nature-related benefits of outdoor recreation participation between Hispanics and Anglos, and within the each group. Using factor analysis, Hispanic respondents were categorized into three groups: least acculturated, bicultural, and most acculturated. A strong Anglo-conformity pattern was found in the perceived importance of nature-related benefits from outdoor recreation participation when comparing these three groups to Anglo-Americans. In terms of family-related benefits, the results showed that bicultural Hispanics placed more importance on these benefits than did Anglos. However, there was no significant difference between the two groups (least-acculturated and most acculturated) and Anglos.

Allison and Geiger (1993) investigated the leisure patterns and nature of the Chinese-American elderly. Twenty-five people were interviewed to examine the types of activities they participated in, the nature of these activities, and the reasons for continued participation. The results indicate that leisure activities served educational and cultural, as well as entertainment and personal development, functions. The key findings in this paper are: (a) for some elderly, many activities are still maintained after residing in the United States for over 30 years, supporting the theses of selected acculturation and expression of culture; and (b) the same activity may have different meanings for Chinese-Americans and Anglo-Americans.

Yu and Berryman (1996) investigated the recreation activity participation levels and patterns of recently arrived Chinese immigrant adolescents in New York and the relationships of their recreation behaviors to the levels of acculturation and self-esteem. The results indicate that respondents with a low level of acculturation exhibit a higher level of self-esteem, and tend to less often associate with non-Chinese people for recreation. Students with higher level of acculturation tend to participate in recreation activities and affiliate more often with organizations.

E. H. Tsai (2000) examined the influence of acculturation on perception of leisure constraints of Chinese immigrants. This study's findings suggest that acculturation levels did contribute to the perception of leisure constraints, with less acculturated immigrants being more susceptible to leisure constraints examined.

Using Markus and Kitayama's (1991) concept of self-construal as a theoretical framework, Walker et al. (2001) examined Chinese and Euro-North Americans' motivations for outdoor recreation in a Canadian national park. They found that the more acculturated Chinese are, the more independent they become and the more likely they are to emphasize independent-type motives.

More recently, Hung (2003) found that Chinese in Greater Vancouver, Canada with a higher level of acculturation visited wilderness areas more frequently than Chinese with a lower level of acculturation. In addition, more acculturated Chinese were more likely than their less acculturated counterparts to participate in more physically demanding or "hard adventure" activities, which, according to Yu and Berryman (1996), are less likely to be pursued by Chinese.

These studies suggest that acculturation does appear to influence various aspects of leisure/recreation such as participation in activities, leisure meanings, leisure motivations, and leisure outcomes. However, although acculturation can, to some extent, affect the leisure behaviors of a minority group, some of its cultural values may still be maintained. For instance, the Hispanic value of familism does not change much due to acculturation (Gramann et al., 1993; Shaull & Gramann, 1998). Similarly, Allison and Geiger's (1993) study shows that elderly Chinese Americans still participate in traditional ethnic activities after 30 years. Finally, Walker et al. (2001) also found that acculturation does not change the Chinese interdependent self-construal, though it does influence their independent self-construal. In summary, it can be inferred from these findings that some "basic" values held by a minority members are not readily changed during the process of acculturation. Thus, it would seem likely that the traditionally less valued Chinese attitude toward leisure may still persist regardless of acculturation.

Summary and Conclusion

As happiness and quality of life are the two goals pursued by all humans, regardless of ethnic and racial differences, perception of and attitudes toward leisure may have some common attributes shared by all. For instance, the classical Grecian definition of leisure as a state of being is shared by ancient Chinese philosophers; the work ethic is valued highly both by Western society and Chinese people; and, before modern times, leisure pursuits were limited to the aristocratic few in both Western and Chinese societies. Furthermore, commonalities in how leisure is conceptualized cross-culturally may become even more likely due to the impact of globalization. However, leisure, as integral component of a culture, has its roots in historical, social, economic "soils" of that culture, and thus exhibits specific aspects that distinguish it from those of other cultures, especially those cultures with distinct characteristics. For example, as indicated above, American Koreans have different perception of leisure from Anglo Americans; Mexican Americans are more likely to be positive toward leisure than their Anglo-Canadian counterparts; and Chinese are more likely to pursue passive leisure activities than North Americans, they tend to display "leisure lack," and they also place less value on leisure (Hall & Rhyne, 1989).

In many respects, an understanding of differences in leisure attitudes across cultures is more challenging than is an understanding of leisure definitions. When conceptions of leisure are generally categorized into three dimensions the objectives that leisure attitudes are oriented toward could be both extremely numerous and extremely diverse. In this sense, to measure general leisure attitudes is insufficient to uncover the whole world of leisure domain. Rather, an understanding of situation-centered leisure attitudes between cultures would be more helpful in trying to understand cross-cultural differences.

CHAPTER THREE

RESEARCH METHODS

After ethic approval was obtained from the University of Alberta Faculty of Physical Education and Recreation Ethics Committee, the mail-administered survey data for this thesis were collected from a stratified systematic sample of 178 Chinese and 160 Anglo-Canadians who resided in Edmonton, Alberta, Canada. Random sampling allowed statistical comparisons in the three study areas to be conducted between Chinese and Anglo-Canadians (cf. Floyd, 1999; Hutchison, 1988). The approach of sending out questionnaires following advance phone calls was efficient and cost-effective, in that ineligible participants can be screened out. In addition, all seven measures used in this study tested well for validity and reliability. Finally, factor analysis allows attitude comparisons to be undertaken based on a number of sub-scales. The subsequent statistical analyses, including analysis of covariance and multiple regressions, were performed on these sub-scales. These statistical analyses provide more information on similarities and differences in attitudes between the two groups than analyses that would be made based on a single scale.

This chapter consists of three sub-sections. The first sub-section presents the method and procedure used for data collection. A discussion of the measures selected to address acculturation, and the six measures used in connection with attitudes toward the revised policy, functions and roles, and appropriate uses of national parks, the environment (measured by the Environmental Value Scale and the NEP), and leisure, respectively comprises the second section. The third and final sub-section deals with the method used for data analysis.

Data Collection

Study Area and Target Population

The city of Edmonton was chosen as the study area. Chinese from mainland China and Anglo-Canadians were the two target populations of this study. In order to be able to test the fourteen hypotheses it is necessary to have access to a sufficiently large and well established Chinese community. This community must also include Chinese residents that have lived in the area for a substantive period of time while at the same time contain a growing Chinese population that is being augmented by an on-going inflow of new Chinese residents. Edmonton exhibits these characteristics. According to the Canada census 2001, there are 99,100 Chinese living in Alberta, Canada, accounting for appropriately 3.4% of the total population of the province (Statistics Canada, 2003a). Most of them reside in the two main cities in the province--Edmonton and Calgary--with some 41,300 Chinese residing in Edmonton, accounting for 4.5% of the metro Edmonton population of 927,000, and making it the fifth highest population of Chinese in the country (Statistics Canada, 2003a). Among these Chinese are 10,150 Chinese from mainland China, which is among the top ten places of birth for total immigrants in Edmonton (Statistics Canada, 1996a), and accounts for the largest percentage of all Chinese in Edmonton. Therefore, Chinese from mainland China are considered the target population of all Chinese in Edmonton for the purpose of this study.

As for Anglo-Canadians in Edmonton, a total of 519,200 individuals identified them as being of English, Welsh, Scottish, and /or Irish origins, accounting for 56% of the total metro Edmonton population (Statistics Canada, 2003b).

Sampling

The optimal approach to obtaining a sample largely depends on the purposes of a study and the availability of resources such as money, time, and personnel (Fowler, 1993). If a study is not to generate statistics about a population, a convenience sampling method or snowball method is useful. This method has been used in previous studies involving Chinese and leisure (E. H. Tsai 2000); Chinese and the environment (Leung & Rice, 2002); and Chinese and wilderness-oriented parks (Hung, 2003). However, the main disadvantage of this kind of method is its generalizability of research findings to a wider population because of the lack of a representative sample and the possibility of group similarities of respondents (Palys, 1997; cited in Hung, 2003). In terms of the purpose of this study, where the results of attitude comparisons should generally reflect the reality of the two populations, a random sampling is obviously more appropriate than the convenience or snowball method. Moreover, a sample obtained from random sampling allows statistical analysis to be undertaken that meets the assumptions required for multivariate regression and analysis of covariance.

Due to the limitations of research resources such as money and time in the current study, a widely used population research survey methods, area probability sampling and random-digit dialing (Fowler, 1993), are not practical. Stratified systematic sampling method is suitable for this study. First, some characteristics of individual population members are known before data collection. For instance, the majority of Chinese immigrants have arrived in Canada during the past decade or so, and they can be identified from the way their surnames and given names are spelled. Moreover, their acculturation levels could be partially reflected by the different ways that their surnames and given names are spelled. That is, those Chinese whose given names are English while surnames are spelled in Hanyu pinyin tend to be more easily acculturated (Kang, 1972; cited in Dion & Dion, 1996). Therefore, it is possible to assign an equal quota of sample of 200 to each of three acculturation groups--high acculturated, middle acculturated, and low acculturated to have a sample of 600 in hopes of having at least 150 returned usable questionnaires (see below for more detailed discussion). In the case of Anglo-Canadians, each of the 50 commonest English surnames ("Britain Coat", n.d.) can be assigned with 12 persons to form a sample of 600. Second, the 2002 Edmonton Phone Directory provides a convenience for creating a list of all Chinese individuals and Anglo-Canadians whose surnames are among the 50 commonest surnames. Stratifying in advance ensures that the respective sample will have exactly the same proportions in each acculturation level for the Chinese and each surname for Anglo-Canadians as the whole population (cf. Fowler, 1993).

A sample of 600 persons was assigned to each group. A total of 22,403 Anglo-Canadians were identified (see Appendix B). Twelve persons were assigned to each of 50 English surnames. The potential participant in each surname group was selected based on the interval that was calculated by the number of persons by the surname divided by 12. The starting number for each surname group was randomly selected from the random table (see Appendix B). For the Chinese, every 1 out of 8 persons in the list of the Chinese (see Appendix C) whose surnames and given names are spelled in Hanyu pinyin system was included in a sample of 400 persons and every 1 out of 2 persons in the list of the Chinese (see Appendix C) whose surnames are spelled in Hanyu pinyin while given names in English was included in a sample of 200. The purpose of this sample size arrangement for the Chinese is to ensure that the study participants have a varied level of acculturation. As discussed in the first section, the majority of the Chinese in Canada are integrated, and assimilated and segregated Chinese account for a small percentage of all Chinese in Canada, respectively (Goldmann, 1998). Thus, in order to ensure an equal coverage of potential respondents with three different levels of acculturation, a sample of 200 was assigned to the list of 477 Chinese whose surnames are spelled in Hanyu pinyin system while given names are English. It anticipates that Chinese with this characteristic are more likely to be assimilated or highly acculturated as discussed earlier.

Advance telephone calls were conducted to recruit and screen out respondents, and then a self-completed questionnaire was mailed to all qualified participants (cf. Angus Reid Group, 1993).

Identification of Participants

Identification of potential Chinese participants. Most recently arrived Chinese individuals retain their full Chinese name, which is easily distinguished from names associated with other cultures (a few unique Cantonese surnames may be biased. For example, the surname "Lee" includes both the Anglo and Korean Lee families). In contrast, Chinese who have lived in Canada or other adopted countries and regions for longer periods of time, or those who are recent arrivals but hope to be accepted quickly by the adopted society, tend to retain their last name while "assimilating" their first names into the dominant society. Consequently, it is possible to develop a sampling frame by looking up the telephone numbers of Chinese residents listed in the local telephone directory (cf. Stodolska & Jackson, 1998). There are, however, problems with this sampling method since lower income households may not be included as some of them do not have telephones, while higher income households may not be included because of unlisted telephone numbers.

Having identified an acceptable sampling frame, the next steps are to accurately identify potential participants whose origins are from mainland China, and then to ensure that the participants vary in terms of acculturation. As mentioned above, the most effective way to identify a person who is a Chinese or has a Chinese origin is to check his or her surname. However, it should be kept in mind that different spellings may refer to the same surname because Chinese surnames can be spelled differently depending on where the family comes from. For instance, at least seven different spelling systems are used among the Chinese all over the world. They are Hanyu pinyin, Wade-Giles, Cantonese, Hakka, Hokkien, Hainan, and Teochew ("Surnames Dictionary", n.d.). Officially, two different systems of romanization are utilized, with mainland China using the Hanyu pinyin system of romanization while Taiwan uses the Wade-Giles system. However, the mainland Chinese spelling system is not commonly used in North America by Chinese from Hong Kong, where Cantonese is widely used, and Taiwan, where Wade-Giles system is officially used. For instance, Wang, the most popular surname in the mainland China and North America ("Chinese Sounding", 2002) is spelled "Wang" in the Hanyu pinyin system (mainland China), and "Wong" (Hong Kong). Moreover, Chinese from other origins, such as Vietnam, Singapore, and Malaysia also have a surname-spelling system different from all of the above.

As a consequence of the above, one Chinese surname could potentially have more than one spelling even though they are written the same way in Chinese. For instance, "Yang", spelled in Hanyu pinyin, is also known as Yeo in Hokkien, Yong in Hakka, and

Yeung in Cantonese ("Surnames Dictionary", n.d.) although they all share the same Chinese character "杨." This surname-spelling situation, although complex, can, however, help identify a Chinese individual's (or his or her family's) origins. Hence, Chinese from mainland China could be roughly told apart based on their surname-spelling system. (Although this method is not foolproof. For example, a number of surnames spelled in Hanyu pinyin are also spelled the same way in Wade-Giles. They are "Fan", "Peng", "Ma", etc. This means the Chinese with these family names may either come from mainland China or Taiwan. In this regard, advance phone calls can help screen in order to obtain the type of participant who is needed).

It should be noticed that Hanyu pinyin, the most commonly used system for Chinese romanization, did not become the national standard of mainland China until 1958 (Tsai, 2001). Accordingly, potential Chinese participants from mainland China identified by their surnames spelled in Hanyu pinyin are most likely those who arrived in Canada after the year 1958. This means Chinese participants identified by this approach are most likely the first or at the most the second generation (According to Statistics Canada, 1996b, at the time of the 1991 census, 48% of those Chinese from mainland China living in Canada arrived in the 1980s, while another 27% came between 1971 and 1980. In contrast, 13% arrived in the 1960s, and 12% came before 1961).

Based on the above, a list of Chinese surnames (See Appendix C) identified as spelled by Hanyu pinyin can be created by looking up surnames from the 2002 Edmonton Telephone Directory and by reference to "the Hundred Families Surnames" ("The Hundred", 2002) of Chinese. There are 336 surnames listed at the website. It provides a convenient way to identifying the same surname by pinyin, Wade-Giles, and Cantonese systems. According to one of the site's statistics, the 200 most common surnames included in the "Hundred Families Surnames" account for over 96% of a sample of population of 174,900 Chinese residing in mainland China. Therefore, a list composed of these 336 Chinese surnames could be considered as a nearly complete sample of all of the Chinese residing in Edmonton.

As indicated in Appendix C, a total of 273 surnames in Hanyu pinyin are identified from the phone directory by reference to the Hundred Family Surnames, accounting for 81.3 % of the 336 surnames listed in the website. A total of 3,787 Chinese households from mainland China is also identified by this approach, among them are 477 with English given names.

Identification of English names. As Anglo-Canadians will be used as a comparison group, it is assumed that all of them will share somewhat similar cultural traits. A total of 22,403 Anglo households in Edmonton were identified by reference to the 50 commonest English surnames and the 2002 Edmonton Phone Directory.

Advance phone calls. Advance phone calls (see Appendix D) can be conducted once the identification of potential participants is completed. This study involves two groups of participants whose native languages are different. For instance, the native language for Anglo-Canadians is English, for immigrants from mainland is Mandarin (In Canada, the majority of Chinese immigrants from mainland China are bilingual. At the time of 1991 census, 60% could carry on a conversation in English while 86% reported that Chinese is the language most often spoken at home; Statistics Canada, 1996b). Accordingly, two phone call interviewers with different spoken native languages will be asked to carry out advance phone calls targeted to the two groups: a native English speaker is requested to call Anglo-Canadians while a native Mandarin speaker who is also fluent in spoken English will call immigrants from mainland China.

Advance phone calls for Anglo Canadians commenced on November 15, 2002 and concluded on December 12, 2002. The Chinese were contacted from November 1, 2002 to December 6, 2002. The potential participants from the both groups were contacted mainly during weekend evenings from 7:30 pm to 9:30 pm. If necessary, telephone calls were made to potential participants on four different random occasions. If no contact was made at the end of this process, the potential participant was dropped from the list.

Sample Size

Because it will be necessary to factor analyze the Environmental Value Scale, the NEP, Leisure Attitude Scale, and National Park Attitude Scales, it is anticipated that, at a minimum, 150 Chinese and 150 Anglo-Canadians participants will be needed so as to have a total sample size of at least 300, which, according to Tabachnick and Fidell (1996), is adequate for factor analysis as a general rule-of- thumb. Additionally, this number of participants will also provide sufficient power for a MANCOVA and ANCOVA on the three scales by ethnicity (see Lauter, 1978, and Cohen, 1992, respectively).

Questionnaire Development and Distribution

Three versions--English version, Chinese version (in English) and Chinese version (in Chinese)--of the survey questionnaire were developed to target Anglo-Canadians and Chinese immigrants, respectively. The English version of the questionnaire includes four sections such as measurements of attitudes toward national parks, the environment, leisure, and background information. In addition to these four sections, one more section--measurement of acculturation--was included in the two Chinese versions of the questionnaire. The Chinese version (in Chinese) were developed following modified Marin and Marin's (1991) recommendations regarding back translating and decentering survey instruments. This type of two-way translation has been widely used in the leisure research literature (Caro & Ewert, 1995; Chan, 2001; Corral-Verdugo & Armendariz, 2000; Schultz & Unipan, 2000; Walker et al., 2001). Instead of the classic two-way translation, in this study, first, two bilingual Chinese scholars (one being the writer of this dissertation) having shared backgrounds translated separately the Chinese version (in English) of the questionnaire into Chinese, and then the two translators discussed together the accuracy and appropriateness of both translated versions. The Chinese version in Chinese based on this discussion was then presented together with its version in English to a third Chinese scholar for final review. Based on this approach, a final Chinese version in Chinese was developed. The Chinese versions (in Chinese) of the cover letter, the participant information letter, the informed consent form, and the follow-up letter were all translated from each of their English versions (see Appendix E) following the same approach.

Chinese individuals who agreed to participate were then offered the choice of completing either an English (see Appendix F) or a Chinese language version (see Appendix F) of the study questionnaire. After their preferred language was identified, a copy of the questionnaire, a cover and information letter, two copies of informed consent form, and a stamped and self-addressed envelope were mailed out to those who were willing to participate in the study. Following Dillman's Total Design Method (Dillman, 2000), a follow-up reminder card was sent to those who received the questionnaire but did not return it within two weeks. Another follow-up reminder card was sent to who have not returned their questionnaires within three weeks. Finally, a follow-up letter together with a full package of survey documents were sent to those individuals who still have not responded within four weeks.

Measures

Seven main measures relating to acculturation, national parks, the environment, and leisure are discussed in this sub-section.

Measurement of Acculturation

When ethnic values, attitudes, and behaviors are compared with those of the majority group, it is essential that the concept of acculturation is also measured. Therefore, a tailor-made measure that can properly reflect the type, dimension, and process of acculturation, as well as the profound cultural traits of both the "mainstream" culture and the specific culture in question, is critical. Otherwise, any explanation of findings involving the measure may incorrectly incorporate "common-sense meanings, which are embedded in implicit assumptions about cultural and ethnic difference" (Hunt, 1999, para. 1). In view of this, I will: (a) examine the characteristics of acculturation, (b) review the major acculturation measurement scales in general, and those dealing with Chinese specifically, and (c) based on the above, propose an acculturation instrument specifically designed for Chinese individuals.

Characteristics of Acculturation

Acculturation has been widely recognized as a process in which an individual, due to immediate contact with an adopted society, undergoes the loss of his or her original cultural traits and values while gaining those of the host culture. Although acculturation and assimilation are often used interchangeably in the literature, acculturation is conceptually different from assimilation in that assimilation is either just the “terminal stop” in the process of acculturation (Suinn, Ahuna, & Khoo, 1992) or a sort of "perfect" form of acculturation (Pires & Stanton, 2000). Indeed, most of the acculturation scales that utilize multiple indices measure not only acculturation (based on, for example language use and food consumption), but also assimilation traits (such as cultural orientation, and ethnic identity). In general, however, acculturation is described in terms of three separate domains: the acculturation process, acculturation dimensions, and acculturation typologies.

Acculturation process. Traditionally, the process of acculturation has been viewed as being linear, one-dimensional, and unidirectional, with the individual eventually and inevitably ending up being assimilated into the mainstream society. Today, the process of acculturation is generally viewed as being bi-directional, multidimensional, and dynamic such that an individual may either maintain his or her cultural traits and values, or become assimilated into the mainstream society.

Acculturation is a multidimensional process in that an individual may experience different aspects of acculturation. For instance, Gordon (1964, 1975) identified seven progressive dimensions of the acculturation/assimilation process: (a) cultural assimilation (acculturation), (b) structural assimilation, (c) marital assimilation, (d) identificational assimilation, (e) attitude receptional assimilation, (f) behavior receptional assimilation, and (g) civic assimilation (cited in Hazuda, Stern, & Haffner, 1988). This pattern of acculturation indicates that acculturation is a progressive process in which an individual begins with cultural acculturation and ends with complete assimilation, the last being characterized by the “absence of value and power conflict” with the host society (Hazuda et al., 1988, p. 690). It should also be noted that arrival at the final stop--civic assimilation--does not necessarily mean the complete, or even partial, loss of one's original cultural traits, such as language and food preferences. Rather, Orozco, Thompson, Kapes, and Montgomery (1993) stress that an individual "may adopt specific traits from the new culture, may discard some native traits, but may retain or even strengthen still other traditional cultural values and behaviors" (p. 150).

In contrast with the model described above, the process of acculturation is now widely accepted as being orthogonal rather than linear. For example, according to Oetting and Beauvais (1990-1991):

> Cultures are not placed at opposite ends of a continuum but rather at right angles to one another. Increased identification with one culture does not require decreasing identification with another. It is possible for an individual to express high identification with culture A and low identification with culture B or vice versa, high identification with both, or low with both. (cited in Lessenger, 1997, p. 388)

Gans (1997) also endorses this argument by stating that, "ethnic identity is even compatible with assimilation. For example, ethnic group leaders may lead public lives in the ethnic community while devoting part of their private lives to assimilatory activities" (p. 883). In this sense, therefore, ethnic identity may vary across situations, a possibility that will be discussed more fully in the next section.

Acculturation dimensions. Although two acculturation dimensions have been identified by researchers, differences in what these dimensions exactly are do exist. For example, Szapocznik, Scopetta, Kurtines, and Aranalde (1978) identify behavioral acculturation and value acculturation; Padilla (1980) describes cultural awareness and ethnic loyalty (cited in Lessenger, 1997); and Gentry, Jun, and Tansuhaj (1995) propose a behavioral dimension and an attitudinal dimension (cited in Pires & Stanton, 2000). In general, the behavioral acculturation/dimension and the cultural awareness dimension refer to language preferences, habits, and/or food consumption, whereas the value/attitudinal acculturation and ethnic loyalty dimensions involve "cultural identification, pride, ethnic attitude, ethnicity, self-identification, spouse's ethnic identity and social interaction" (Pires & Stanton, 2000, p. 47).

Acculturation typologies. Mendoza (1989) proposed four typological patterns of acculturation: (a) cultural resistance, (b) cultural shift, (c) cultural incorporation, and (d) cultural transmutation (cited in Pires & Stanton, 2000). In a similar manner, Berry (1980) identified four types of acculturation strategies: (a) assimilated, (b) integrated, (c) separated, and (d) marginalized. According to these two classification schemes, an individual could, consequently, become Western identified (i.e., cultural shift/assimilated), ethnic identified (i.e., cultural resistance/separated), acculturated/bicultural (i.e., cultural incorporation/integrated), or culturally unique (i.e., cultural transmutation/marginalized).

Acculturation Scale

Potentially, a soundly conceptualized measurement instrument should be able to reflect the three acculturation domains of process, dimensionality, and typology. In reality, however, few measurement scales currently do so. Furthermore, although no acculturation measure can be applied universally, all of them should share many common indicators, because all ethnic groups are put in the same "cultural experiment lab" (i.e., the United States or Canada), and are, therefore, referenced by the same cultural standards of the adopted society.

Acculturation was initially measured using a single index, such as language use (e.g., Angel & Worobey, 1988; Floyd & Gramann, 1993; Marin & Marin, 1991; Schultz et al., 2000; Shaull & Gramann, 1998; Walker et al., 2001), economic status (e.g., Noe & Snow, 1989), place of birth (e.g., Caro & Ewert, 1995), or arrival age/length of residence (e.g., Caro & Ewert, 1995). Among these, language as an index was widely recognized as an inherent component of culture, and even as the proxy for culture, and therefore was viewed as "an important factor in acculturation" (Goldmann, 1998, p. 127). According to Marin and Marin (1991), "linguistic items alone give equally good results as do more complex sets of questions for determining acculturation levels" (cited in Hunt, 1999, Examples of acculturation scales, para. 3). In spite of the importance of language as an index, however, language alone is generally seen as being insufficient. Rather, most acculturation measures now include multiple indices, including language, ethnic identity, religious beliefs, social relationships, knowledge about one's original culture and historical events, cultural pride, and attitudes toward intermarriage, sex roles, and family values/practices. These categories are more or less reflective of the seven acculturation dimensions identified by Gordon (1964).

A number of acculturation scales have been developed to target specific ethnic groups, such as: (a) Mexican Americans (e.g., the Acculturation Rating Scale for Mexican Americans, or ARSMA; Cuéllar, Harris, & Jasso, 1980; the Acculturation and Structural Assimilation Scales, Hazuda et al., 1988; and the Acculturation Rating Scale of Mexican Americans-II, or ARSMA-II; Cuéllar, Arnold, & Maldonado, 1995), (b) African

Americans (e.g., the African American Acculturation Scale; Landrine & Klonoff, 1994), (c) Asian Americans (e.g., the Suinn-Lew Asian Self-Identity Acculturation Scale, or SL-ASIA; Suinn, Richard-Figueroa, Lew, & Vigil, 1987; and the SL-ASIA-II; Suinn et al., 1992), and (d) Chinese Americans (e.g., the General Ethnic Questionnaire--Chinese version; J . L. Tsai, 2000). Most of these scales, along with others not specifically identified, are bi-directional with lower scores indicating low acculturation (separation/ethnic identified), higher scores indicating high acculturation (assimilation/Western identified), and scores falling in between indicating biculturalism (integrated). Hence, these types of scales reflect three of the four types of acculturation. Among these scales the ARSMA-II and SL-ASIA-II distinguish themselves from the others by considering the orthogonal attribute of acculturation, and by reflecting all four typologies as well as other subcategories. For instance, SL-ASIA-II not only can be used to identify the fourth typology (i.e., alienated or marginalized), but also the three subcategories of "bicultural, Asian self-identity," "bicultural, Western Self-identity," and "bicultural, bicultural self-identity" (Suinn et al., 1992, p. 3).

The SL-ASIA and its updated version, the SL-ASIA-II, were specifically developed to measure acculturation within Asian groups (see Ponterotto, Baluch, & Carielli, 1998 for a more detailed discussion of this development). The SL-ASIA has 21 composite items that cover six dimensions of acculturation: language, identity, friendship choice, behaviors, generation/geographic history, and attitudes. The multiple-choice questions, characterized by multiple cultural traits, allow an individual to focus on more than one type of cultural trait. The SL-ASIA-II is composed of 26 items with 5 new items being added to the original, thus allowing an identification of marginalized acculturation and subcategories, as mentioned above. Despite the advantage of these scales, it should be noted, however, that they were both modeled after the ARSMA and, further, that the reliability and validity of the SL-ASIA is based on samples composed of college students.

Moreover, using one scale for all Asian groups may not reflect the cultural traits of a specific group (Suinn et al., 1987), such as the Chinese. According to the authors, it appears that a separate scale for a specific Asian group is more appropriate in view of another fact that "it has been felt necessary to design separate instruments for Mexicans, and Cubans" among Hispanic groups (Suinn et al., 1987, p. 405). The SL-ASIA has been applied to such Asian groups as Japanese Americans (i.e., Atkinson & Matsushita, 1991), Vietnamese Americans (i.e., Duan & Vu, 2000), and Chinese Americans (i.e., Tata & Leong, 1994), but almost all of these subjects were college students. Although there is little discussion of the SL-ASIA's applicability and appropriateness to these three groups in the respective studies, Duan and Vu did endorse Suinn and his colleagues' concern that the scale fails to identify behaviors that are situational--and this limitation is particularly important because situational behavior is a characteristic of Chinese culture (He, 1991, cited in Yang, 1993). Specifically, according to He, relatedness to others distinguishes Chinese culture from other cultures, and this pattern of relationship is situation centered. Even in terms of ethnic identity a person's behavior is changeable, since an: "individuals' preferences at different times [depend] on the circumstances" (Pires & Stanton, 2000, p. 49). Failure of the SL-ASIA and SL-ASIA-II scales to reflect situational behaviors raises the issue of what ethnic group cultural values or traits should be included in an acculturation scale. This issue is prevalent with many acculturation scales and remains largely unaddressed.

Arguably, measuring behavioral acculturation is less challenging than measuring attitudinal/value acculturation. As “acculturation is defined as an individual’s learning of the traits of another culture, the greater the progression toward the attitudes and values of the host culture, the greater the degree of acculturation" (Laroche, Kim, & Clarke, 1997, cited in Pires & Stanton, 2000, p. 48). Thus, following this line of thought, in order to measure the degree of acculturation, it is necessary to measure the degree to which an individual shares similar attitudes and values with those in the host culture. According to Kim, Atkinson, and Yang (1999), “adherence to ancestral values and the values of the dominant culture are essential components of an individual’s acculturation” (p. 343). To this end, a measure may need to be developed which includes the distinct cultural traits of both the parent culture and the host culture.

In this sense, any differences observed in the measurement of leisure, environmental, and national park attitudes can be regarded as possible surrogates of acculturation. It is difficult to accurately assign traits to "mainstream" versus ethnic culture in an already mixed society and under the influence of globalization, which draws different cultures closer to each other (Hunt, 1999). Moreover, attitudes and values can be extremely varied and numerous. In realizing this challenge, Siunn et al. (1992) in their updated version of the SL-ASIA used the following statements: “Rate yourself on how much you believe in Asian values (e.g., about marriage, families, education, work)” and “Rate your self on how much you believe in American (Western) values.” Whilst this kind of wording can reflect an individual’s value acculturation to some degree, it is, however, too loose and too broad to get at its essence. Rather, a specific cultural trait (i.e., self-construal; Markus & Kitayama, 1991) that can sharply distinguish between the host

(Western) culture and the original culture (Asian in general, Chinese in specific) will likely work better. For example, based on the theoretical concept of independence-interdependence, Shiang (1998) developed an instrument to measure cultural change in terms of family, social, and work relationships, which can be seen as an extended version of the two value measurement items included in SL-ASIA-II.

In view of the limitations of SL-ASIA-I and SL-ASIA-II in measuring the acculturation level of Chinese in North America, a Chinese specific measure seems to be needed. Such a measure was developed by J. L.Tsai (2000). However, even this measure does not seem to be entirely satisfactory.

The General Ethnic Questionnaire--Chinese version (J. L.Tsai, 2000) was developed specifically for measuring Chinese acculturation. It is composed of 38 single statements that examine cultural exposure (childhood and adult), cultural pride, cultural attitude, behavior (i.e., food, music, and dance), residential location choice, customs, cultural orientation, and language use and ability. Because all of the statements are skewed toward Chinese culture, measurement of acculturation level ranges from low to high (vs. acculturation types, with the SL-ASIAs). Although a majority of the 38 items reflect Chinese cultural traits such as cultural pride (generally, most Chinese people are proud of Chinese culture and history, if one self-identified himself or herself as Chinese, he or she may feel the same way), childrearing (most overseas Chinese emphasize the importance of having their children learn Chinese), and Chinese customs/festivals, it seems other important aspects of cultural traits such as religious beliefs, interpersonal interactions, cultural values and attitudes (i.e., some distinct beliefs based on the theory of self-construal) are not included in the measure. According to Statistics Canada (1996b), in

1991, 67% of all immigrants from mainland China reported they had no religious affiliation, compared with only 15% of all immigrants and 12% of the Canadian-born population.

An examination of the scale's wording suggests that some of statements might not be entirely appropriate. For instance: (a) item 4 "Compared to how much I negatively criticize other cultures, I criticize Chinese culture less" is somewhat sensitive; (b) item 10 " I go to places where people are Chinese" and item 13 "I admire people who are Chinese" are very ambiguous; (c) item 16 "I perform Chinese dance" is not a typical Chinese behavior; (d) item 20 "At restaurants, I eat Chinese food" would be better expressed if written like "I prefer to go Chinese restaurants to eat food"; and (e) item 24 "The people I date are Chinese" may not be suitable for all ages of people, especially for married couples. Finally, in terms of language measurement, the use of items such as "How much do you speak" or "how fluently do you speak" might be better expressed as "How much do you prefer to speak" as the latter better represents the emotional value of expression. For instance, Korzenny, (1999) found that individuals who are obviously fluent and proficient in the English language, still "recognize the expressive and emotional values of Spanish for themselves" (p. 4). With reference to mass media, four scale items are used to measure this aspect of acculturation. They are: (a) item 31 "How much do you view, read, or listen to Chinese *on TV*?" (b) item 32 "How much do you view, read, or listen to Chinese *in film*?"; (c) item 33 "How much do you view, read, or listen to Chinese *on the radio*?"; and (d) item 34 "How much do you view, read, or listen to Chinese *in literature*?". Although it may be inferred from these items that lower scores mean higher acculturation, it should be noted that due to various structural constraints (e.g., money; Jackson, 1999) even a newcomer to the host country may have little choice but to spend his or her time or listening to English media. Hence, using the phrase "prefer to" would seem more appropriate.

As acculturation is concerned with the degree to which an individual psychosocially and socially adapts to his or her host society, then it would seem necessary for an effective measure to focus more on the psychological dimensions than behavioral ones. Additionally, because language may be merely the necessary condition for acculturation to occur, ability and proficiency in English can be developed in a separate, distant society, such as China. On the other hand, even an individual who has a poor understanding of English can become acculturated by personally observing what happens in the host society. Thus, it would seem that it is immediate contact with the host society that plays the key role in shaping one's acculturation process and outcomes. Based on this proposition, it would appear that more attention should be paid to an individual's social interactions.

Development of An Acculturation Instrument for Chinese Individuals

Based on above analysis of both theoretical and empirical findings, in order to develop an acculturation scale for Chinese individuals, the following guiding principles should be followed: (a) item wording reflects the psychological more than behavioral dimension of acculturation; (b) more items should focus on an individual's social relationships; (c) although an instrument should reflect all domains of acculturation, a bi-directional instrument will be used because a minority of Chinese in Canada may fall into the marginalized category; (d) this instrument will include items that can reflect most dimensions of the acculturation process; (e) a balance will be achieved by measuring attitudinal/value acculturation (i.e., self-construal); and (f) although composite items work better than single items, in this study, a single statement scale will be adopted, due to the large number of other scales included in the questionnaire.

In conclusion, a measure of acculturation that is able to scientifically reflect the nature of Chinese cultural values as well as the psychological and behavioral traits of Chinese immigrants is essential for examining potential attitude changes resulting from acculturation, compared with Anglo-Canadians. Otherwise, findings based on an invalid and unreliable measure would cover the truth. To this end, a new measure (Table 3-1) that is specific to Chinese immigrants was developed in this study by drawing upon established measures as discussed above as well as others such as measures developed by Mah (1995), Kim et al. (1999), Marin and Marin (1991); Shiang (1998), and Walker et al. (2001).

Table 3-1

Acculturation Scale Items

Item	Item Source and/or Citation
1. I was raised in a way that was Chinese	J. L. Tsai (2000)
2. I am proud of Chinese culture	J. L. Tsai (2000)
3. I believe that my children should read, write, and speak Chinese	J. L. Tsai (2000)
4. I would prefer to live in a Chinese/ Chinese Canadian community	Modified from J. L.Tsai (2000)
5. I prefer to go to Chinese restaurants for friend gatherings	Modified from Mah (1995) and J. L.Tsai (2000)

(*Table continues*)

Table 3-1. (*continued*)

Item	Item Source and/or Citation
6. My friends are Chinese/Chinese Canadians	Modified from J. L.Tsai (2000)
7. Overall, I am Chinese	J. L.Tsai (2000)
8. Given a choice, I would prefer to go to Chinese social occasions to mainly White gatherings	Mah (1995)
9. When I am around White people, I am conscious of being "different"	Mah (1995)
10. I prefer to eat Chinese food at home	Adopted from Mah (1995) and J. L.Tsai (2000)
11. I sometimes wish I could be White instead of being Chinese	Mah (1995)
12. When one receives a gift, one should reciprocate with a gift of equal or greater value	Kim et al. (1999)
13. One needs not achieve academically to make one's parents proud	Kim et al. (1999)
14. One should be humble and modest	Kim et al. (1999)
15. I prefer to speak Chinese	Marin & Marin (1991); Walker et al. (2001)

(*Table continues*)

Table 3-1. (*continued*)

Item	Item Source and/or Citation
16. I prefer to read in Chinese	Marin & Marin (1991); Walker et al. (2001)
17. I prefer to write in Chinese	Marin & Marin (1991); Walker et al. (2001)
18. I prefer to listen to Chinese music	Modified from Mah (1995) and J. L. Tsai (2000)
19. I will financially support (or currently do support) my parents when they are old	Adopted from Kim, Atkinson, & Yang (1999) and Shiang (1998)
20. I am a frequent Western church goer	New item
21. I celebrate Chinese holidays	J. L. Tsai (2000)
22. I feel that my relationships with others are more important than my own accomplishments	Marin & Marin (1991); Walker et al. (2001)
23. I enjoy being unique and different from others in many respects	Marin & Marin (1991); Walker et al. (2001)
24. It is important to me to consider my friends' opinions before I act	Marin & Marin (1991); Walker et al. (2001)

Note. Participants were instructed: "Listed below are statements about acculturation. Please use the following scale to indicate how much you agree or disagree with it by circling your response." Items are measured using a 5-point scale (1 = strongly disagree, 5 = strongly agree).

Measurement of Attitudes toward National Parks

As discussed in the literature review section on national parks, three types of attitudes toward national parks will be measured in this study: two are general attitude measures on the revised policy and roles and functions of national parks; the third is a specific attitude measure on appropriate uses of park resources. The following is an examination of relevant measure scales developed and applied in the past studies.

Revised Policy of National Parks

Maintenance of ecological integrity of park resources is now the first priority of Canada's national parks instead of the previous dual mandate of protection and recreation. To achieve this goal, an important measure to be taken by Parks Canada is to limit visitor use within parks, which could initiate negative responses among Canadians because of the limitation of recreational activities, facilities, and services available within national parks. However, Canadians' reaction to the new policy may be very positive since the majority of Canadians are in favor of preservation over recreation and education. Therefore, the measure of the revised policy will focus on limited use of national parks and its potential reaction among Canadians (see Table 3-2).

Table 3-2

National Park Policy Scale Items

Item	Item Source and/or Citation
1. Parks Canada should limit the numbers of visitors if the ecological integrity of the parks is threatened	All items except item 7 are adopted from G. S. Swinnerton (personal communication, May 20, 2002)
2. Parks Canada is too lenient in allowing recreation activities that harm the environment	

(*Table continues*)

Table 3-2. (*continued*)

Item	Item Source and/or Citation
3. Parks Canada is tending to unnecessarily restrict public enjoyment and use of parks in order to promote greater preservation of the park environment	
4. Parks Canada is becoming too concerned with protecting ecological integrity.	
5. Parks Canada should be willing to compromise on protecting the park environment in order for visitors to experience as wide range of outdoor recreation activities as possible within national parks	
6. Parks Canada does not pay sufficient attention to the outdoor recreation needs and preferences of park visitors	
7. Parks Canada should limit recreational/tourism activities, facilities, and services if the ecological integrity of the parks is threatened.	New item
8. Neither the provision of a wide variety of visitor activities nor commercial activity threatens the integrity of the national parks.	

(*Table continues*)

Table 3-2. (*continued*)

Item	Item Source and/or Citation
9. Parks Canada should use ecological integrity as the primary criterion for all resource and visitor management decisions within national parks	
10. Parks Canada should phase out inappropriate and non-conforming recreational uses within national parks	

Note. Participants were instructed: "Listed below are statements about national park policy. Please use the following scale to indicate how much you agree or disagree with it by circling your response." Items are measured using a 5-point scale (1 = strongly disagree, 5 = strongly agree).

Roles and Functions of National Parks

Currently, there does not appear to exist a measure that has been specifically developed to measure people's attitudes toward the roles and functions of national parks as a whole. However, there do exist several similar measures that have been developed to examine visitors' attitudes toward a specific national park (Borrie, Freimund, & Davenport, 2001; Kiely-Brocato, 1981; Papageorgiou, 2001) and the general public's values/attitudes toward national parks (see Parks Canada, 2002). The following is an analysis of these measures.

Kiely-Brocato (1981) developed a measure scale to examine visitor attitudes toward resource use and management at Shenandoah National Park, the United States. Two components of attitudes--cognitive and affective--were measured in the scale. The scale has 88 items with each component being composed of 44 items. Most of items are used to examine visitor attitudes toward appropriate uses such as off road vehicles, camping, building, animal feeding, hunting, berry picking, horse travel, foot travel, etc. Only two items may be considered as appropriate to be included in a measure to examine roles and functions of national parks. These two items are: "Identifying and protecting rare animal habitat" and "Protecting the natural habitat of animals from visitors."

Papageorgiou (2001) developed a very simple measure (i.e., with 9 items) to examine visitor knowledge about national parks in general and Viko-Aoos National Park, Greece specifically. Relevant items include "Parks are areas to protect endangered species of flora and fauna" and "Vikos-Aoos is divided into two zones" (p. 67).

The third measure was developed by Borrie et al. (2001) to examine visitor attitudes toward Yellowstone National Park, the United States. Several items may be considered relevant to this study. They are "A place of scenic beauty"; "A wildlife sanctuary"; "Protection for fish and wildlife habitat"; "A place for education about nature"; "A place for the use and enjoyment of the people"; "A place for recreational activities"; "A place for scientific research and monitoring"; "A reserve of natural resources for future use"; "An economic resource." These items collectively reflect the roles of national parks in the protection of park resources and the provision of education, recreation, and enjoyment for the public as well as the functions of sustainable use, scientific research and monitoring, tourist destination, and economic resources.

The three studies and associated measures are all national park specific. In contrast, Parks Canada (2002) developed a comprehensive attitude measurement involving such aspects of national parks as values/attitudes toward national parks; awareness/understanding of national parks; knowledge about national parks; support/behavior to national parks; expectations/performance of Parks Canada. There are quite a number of items that are pertinent to roles and functions of national parks. For instance, items such as "I am currently very upset about threats to nature and natural ecosystems in Canada"; "Canada has a responsibility to the world-not just to Canadians-to protect wilderness areas for future generations"; "What is the single most important reason we should protect the natural environment of Canada"; and "Providing opportunities for people to learn about Canada's natural environment" are more or less to measure people's attitudes toward the roles of Canadian national parks.

Based on above examinations of attitudes toward national parks, a measure that specifically targets the roles and functions of national parks was developed for the purpose of this study (Table 3-3).

Table 3-3

National Park Role and Function Scale Items

Item	Item Source and/or Citation
1. National parks are places for protecting the natural environment and wildlife	Adopted from Borrie et al. (2001) if not specified otherwise
2. National parks are places for learning about nature	
3. National parks are places for people' s enjoyment	
4. National parks are places for scientific research and monitoring	
5. National parks are places for recreational activities	
6. National parks are places for protecting cultural and historical heritage	

(*Table continues*)

Table 3-3. (*continued*)

Item	Item Source and/or Citation
7. National parks are areas to protect endangered species of flora, fauna, and wildlife habitats	Papageorgiou (2001)
8. National parks are tourist destinations	
9. Protecting the natural environment and wildlife should be the first priority of national parks	New item
10. National parks are places for commercial development of natural resources (such as: oil, gas, timber, minerals)	New item
11. National parks help to promote a sense of Canadian identity	
12. National parks are reserves of natural resources for future use	
13. National parks provide economic benefits	
14. National parks are places to be protected for the enjoyment of future generations	
15. National parks are places for all living things to exist	
16. National parks help to reduce global warming	New item
17. National parks function as places for spiritual enjoyment ofpeople	New item
18. National parks function to preserve biological diversity	New item

(*Table continues*)

Table 3-3. (*continued*)

Item	Item Source and/or Citation
19. National parks are places to protect scenic beauty of nature	
20. National parks are as places for socializing	

Note. Participants were instructed: "Listed below are statements about roles and functions of national parks. Please use the following scale to indicate how much you agree or disagree with it by Circling your response." Items are measured using a 5-point scale (1 = strongly disagree, 5 = strongly agree).

Appropriate Uses

Two types of measurements have been developed in this regard. One is to list as many uses as possible within national parks and ask people to rate their appropriateness (i.e., Angus Reid Group, 1996; Miller et al., 2001), whereas the other approach compromises single statements (i.e., Kiely-Brocato, 1981; Papageorgiou, 2001). Taking into account the potential questionnaire size in this study, a single statement measurement attempting to examine selective but representative visitor uses has been determined as being the most desirable approach.

In terms of the first type of measurement, Angus Reid Group (1996) listed 52 types of activities and 26 types of facilities and services within Banff National Park, and asked respondents to rank them according to three categories: highly appropriate; moderately appropriate; and not appropriate. It was found that 25 activities and 6 facilities and services were rated as highly appropriate; 9 activities and 9 facilities and services were regarded as moderately appropriate; while 19 activities and 11 facilities and services were rated as not appropriate. This study was limited to Banff National Park. Another study conducted by Miller et al. (2001) listed 33 activities that are typically provided in national parks of England and Wales. Responses from national park visitors (Yorkshire Dales National Park and Peak District National Park) and urban residents (Hertfordshire) indicate that 18 activities were strongly or very strongly endorsed as appropriate; seven were strongly or very strongly endorsed as not appropriate, while eight were regarded as moderately appropriate.

In terms of the second type of measurement, Kiely-Brocato's (1980) measure regarding resource use and management in a national park could be basically considered as a measure of appropriate activities of national parks. Among those 44 cognitive items, quite a number of items are related to visitor activities. For instance, these items include "Prohibiting motorized 'off the road' vehicles in Shenandoah wilderness"; "Prohibiting buildings in Shenandoah wilderness areas"; "Not allowing people to feed animals in visitor use areas"; "Prohibiting tree cutting to clear campsites"; "Prohibiting campfires in Shenandoah wilderness areas"; and "Permitting berry picking for personal use." Likewise, Smith and Alderdice's (1979) measurement of visitors' environmental concern and services concern were used to measure visitors' attitudes toward appropriate uses. For instance, five statements used to measure environmental concern were about the appropriateness of such activities as automobile vehicles, fishing and hunting, snowmobile and mini-motorbike. The third measure proposed by Papageorgiou (2001) is to measure visitors' knowledge about a park's operating regulations. This measure is actually a measure of appropriate uses also. For instance, all seven items involve the appropriateness of such uses as barbecues, buildings, camping, sports activities (football), hunting, road construction, and walking.

Based on above measures, the first type of measurement was used in this study (Table 3-4).

Table 3-4

Appropriate Uses Scale Items

Item	Item Source and/or Citation
Accommodation facilities	
1. Tents/campgrounds	Alberta Community Development (2000)
2. Hotel/motel accommodation	Angus Reid Group (1996)
3. Residency/ permanent homes residency/private homes	Angus Reid Group (1996)
Sport and recreation facilities	
4. Children's playgrounds	Alberta Community Development (2000)
5. Sports fields	Alberta Community Development (2000)
6. Golf courses	Alberta Community Development (2000)
7. Skiing areas	Alberta Community Development (2000)
Service Facilities	
8. Grocery stores and laundromats	Alberta Community Development (2000)
9. Restaurants or lounges	Alberta Community Development (2000)
10. Gas/service stations	Alberta Community Development (2000); Angus Reid Group (1996)
11. Gift shops	Angus Reid Group (1996)
12. Visitor information/interpretive centres	Adopted from Angus Reid Group (1996)

(*Table continues*)

Table 3-4. (*continued*)

Item	Item Source and/or Citation
13. School/educational services	Angus Reid Group (1996)
14. Hospital/medical services	Angus Reid Group (1996)
Outdoor activities	
15. Rock-climbing/mountaineering	Adopted from Angus Reid Group (1996)
16. Sightseeing by car	Angus Reid Group (1996)
17. Hiking/backpacking	Alberta Community Development (2000)
18. Motorized boating	Angus Reid Group (1996)
19. Mountain biking	Alberta Community Development (2000); Angus Reid Group (1996)
20. Jogging/running/walking	Adopted from Alberta Community Development (2000)
21. Wildlife watching	Adopted from Alberta Community Development (2000)
22. Gambling/Casinos	Angus Reid Group (1996)
23. Boating/canoeing/kayaking	Adopted from Alberta Community Development (2000)
24. Picnicking	Angus Reid Group (1996)
25. Hunting	Alberta Community Development (2000); Angus Reid Group (1996)
26. Taking pictures	Adopted from Angus Reid Group (1996)

(*Table continues*)

Table 3-4. (*continued*)

Item	Item Source and/or Citation
27. Gathering natural edible products (fruit, berries, mushrooms, fern fiddleheads etc)	Adopted from Alberta Community Development (2000)
28. Fishing	Alberta Community Development (2000); Angus Reid Group (1996)

Note. Participants are instructed: “List below are selective activities, facilities, and services that are provided in Canadian national parks. Please use the following scale to indicate how environmentally appropriate or inappropriate each is by circling you r response.” Items are measured using a 5-point scale (1 = highly inappropriate, 5 = highly appropriate).

Measurement of Environmental Values and Attitudes

Five hypotheses concerning environmental values and attitudes will be examined as part of this study.

H7: There exist significant differences in environmental values between Chinese in Canada and Anglo-Canadians.

H8: The more acculturated Chinese are, the more similar their environmental values will be to those of Anglo-Canadians.

H9: The less acculturated a Chinese, the higher retention of his or her traditional values.

H10: There exist significant differences in attitudes toward the environment between Chinese in Canada and Anglo-Canadians.

H11: The more acculturated Chinese are, the more likely their environmental attitudes will be similar to those of Anglo-Canadians.

With the above, Hypotheses 7, 8 and 9 examine the retention of cultural values on the environment, which are theoretically stable over time, while Hypothesis 10 and 11 examines potential changes in environmental attitudes, which are often treated as less stable and more changeable relative to values. Consequently, acculturation may have different effects on environmental values and attitudes. Moreover, because values are often treated as the basis for attitudes, an examination of both environmental values and attitudes could be helpful in understanding the relationship between the two. In this sub-section, a measure for environmental values is initially examined. This is followed by a measure of environmental attitudes, with the primary focus being on the latter.

Measurement of Environmental Values

As mentioned in the introduction, Kluckhohn and Strodtbeck (1961) classified cultural values into five main domains: (a) man-nature orientation, (b) man-himself orientation, (c) relational orientation, (d) past-time orientation, and (e) activity orientation. Among these values, two cultural values--man-nature orientation and relationship orientation--are closely related to environmental attitudes/concern and behaviors (Chan, 2001).

More recently, Schwartz (1992, 1994) identified 10 value types that are composed of 56 items. These value types are organized into four value clusters, namely, self-transcendence, self-enhancement, openness to change, and conservation. According to Schwartz (1992), self-transcendence is a general concern with the welfare of others, whereas self-enhancement is an orientation toward self-interests. Openness to change refers to “the degree to which a person is motivated to follow his or her own emotional and intellectual interests, whereas conservation reflects a motivation to preserve the status quo” (cited in Schultz & Zelezny, 1998, p. 541). Previous studies also found that the self-transcendence was significantly positively related to self-reported environmental behaviors (Schultz & Zelezny, 1998; Stern et al., 1995).

The above two value systems are general classifications of human cultural values. In contrast, other research has proposed value categories that are specific to the environment. For instance, Stern et al. (1993) proposed three value orientations (social-altruistic, biospheric, and egoism or self-interest) that govern environmental attitudes or behaviors. The social-altruistic value orientation refers to "concern for the welfare of other human beings," while the opposite of this value orientation is egoism or self-interest, and the biospheric value orientation denotes "concern with nonhuman species or the biosphere." Gagnon Thompson and Barton (1994) also identified two values on which environmental attitudes are based. They are ecocentric and anthropocentric values, with the former "valuing nature for its own sake" while the latter vales "nature because of material or physical benefits it can provide for humans" (p. 149). Similarly, Vaske and Donnelly (1999) have also developed two value orientations which they refer to as biocentric and anthropocentric.

Obviously, the above value orientations are conceptually linked to a certain extent. For instance, the three value orientations proposed by Stern et al. (1993) are conceptually close to the self-transcendence/self-enhancement dimension of Schwartz's (1994) value systems and the relational value orientation of Kluckhohn and Strodtbeck's (1961) value framework. While the ecocentric (biocentric)/anthropocentric dimension of values developed by Gagnon Thompson and Barton (1994) and Vaske and Donnelly (1999) is conceptually similar to man-nature value orientation as identified by Kluckhohn and Strodtbeck (1961).

In order to measure environmental values, Stern et al. (1995) developed a biospheric-altruistic value orientation, a version of Schwartz's self-transcendence dimension. This measure is composed of 10 items (Table 3-5) with a theta reliability coefficient of 0.89.

Table 3-5

Environmental Value Scale Items

Item	Item Source and/or Citation
1.Unity with nature	All items are cited from Stern et al. (1995)
2. Protecting the environment	
3. Preventing pollution	
4. Respecting the Earth	
5. A world at peace	
6. Equality	
7. Social justice	
8. Helpful	
9. A world of beauty	
10. Sense of belonging	

Note. Participants are instructed: "The following is a list of values that are believed to have a bearing on the environment. Please use the following scale to indicate how important or unimportant each statement is to you by circling your response." Items are measured using a 5-point scale (1 = not important at all, 5 = extremely important).

According to Stern et al. (1995), this biospheric-altruistic value orientation is positioned higher in a value-attitude-behavior hierarchy than the New Environmental

Paradigm (NEP; Dunlap & Van Liere, 1978), which is also regarded by some researchers as a measure of value orientation or values. However, Stern et al. (1995) found that the NEP, as a set of general beliefs, “fits into a causal model between values and more specific beliefs, such as beliefs about specific environmental problems” (p. 725), and that the NEP is a separate dimension, “orthogonal to value orientations” (p. 726). For the purpose of this study, I will also treat the biospheric-altruistic value orientation as the basis for the NEP while treating the NEP as a measure of general environmental attitudes. Based on the above, a detailed examination of the NEP follows.

Measurement of Environmental Attitudes

Since the 1970s, social scientists have developed measures to examine the environmental/ecological attitudes of the general public. Among these measures are the Ecological Attitude Scale (EAS; Maloney & Ward, 1973; Maloney, Ward, & Braucht, 1975); the Environmental Concern Scale (EC; R. Weigel & J. Weigel, 1978); the New Environmental Paradigm scale (NEP; Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig, & Jones, 2000); and the Awareness of Consequences (AC; Stern et al., 1993). Of these various scales, the NEP scale “has become the far [most] widely used measure of an environmental or …“ecological” worldview” and “has also become a popular measure of environmental concern” (Dunlap et al., 2000, p. 427).

The basic assumption of the NEP scale is that “implicit within environmentalism was a challenge to our fundamental views about nature and humans’ relationship to it” (Dunlap et al., 2000, p. 427). As an antithesis to the dominant social paradigm (DSP) that “emphasizes exploiting nature for its utility” (Sheppard, 1995, p. 24), the NEP reflects “a pro-environmental orientation” (Dunlap et al., 2000, p. 427) in that the NEP treats the earth as being delicate and limited in resources, humans as being harmoniously linked to the rest of nature, and hence, the economic activities of humans should be limited to balance nature. Therefore, what the NEP measures is "a sort of folk ecological theory of how the world works, the nature of the biosphere, how it functions, and how it is affected by human actions" (Stern et al., 1995, p. 723).

As a measure of environmental concern, the NEP is often viewed as a measure of general environmental attitudes (i.e., Dunlap & Van Liere, 1978; Schultz & Zelezny, 1998; Tarrant & Cordell, 1997). However, Jackson (1986) believed that there was no difference in attitudes and values as measured by the NEP. In contrast, other researchers have argued that what the NEP measures are beliefs and even values or value orientations (Dunlap et al. 2000). For instance, according to Stern et al. (1995), the NEP measures the primitive beliefs about the relationships between humans and nature; and Gooch (1995) emphasized that the NEP measures primitive beliefs or values on the environment rather than environmental concern. Furthermore, Stern, Dietz, and Guagnano (1994) argued that the NEP scale emphasizes beliefs more than values (cited in Stern & Dietz, 1994). The ideas underlying the NEP, according to Stern and Dietz, are also akin to the biospheric value, one of three value bases for environmentalism proposed by Stern et al. (1993). Stern (1992) viewed the NEP as a measure of value orientation toward the environment (cited in Fransson & Garling, 1999). However, Stern et al. (1995) found that the NEP is "orthogonal to value orientations" (p. 726).

In spite of the lack of agreement as to what the NEP actually measures, the NEP has been widely used to measure general environmental attitudes not only culture specific (i.e., Caron, 1989; Corral-Verdugo & Armendariz, 2000; Furman, 1998; Stern et al., 1995), but also cross- culturally/nationally (i.e., Bechtel et al. 1999; Gooch, 1995; Parker & Mcdonough, 1999; Pierce et al., 1987; Sheppard, 1995).

Previous findings proved that the NEP "to be the best measurement instrument for obtaining data on the possible effects of ethnicity on environmental attitudes" (Noe & Snow, 1990, p. 28). Existing studies have also indicated that translation of the NEP scale into other languages for the purpose of ethnic and cross-cultural studies has been relatively free of problems (Caron, 1983; Scott, 1982, cited in Noe & Snow, 1990; Pierce et al., 1987). In view of its wide application in other cross-cultural studies, this study will use the revised NEP scale as a measure of environmental concern (Table 3-6).

Table 3-6

Environmental Attitudes Scale Items

Item	Item Source and/or Citation
1. We are approaching the limit of the number of people the earth can support	All items are cited from Dunlap et al. (2000)
2. Humans have the right to modify the natural environment to suit their needs	
3. When humans interfere with nature it often produces disastrous consequences	
4. Human ingenuity will insure that we do NOT make the earth unlivable	
5. Humans are severely abusing the environment	

(*Table continues*)

Table 3-6. (*continued*)

Item	Item Source and/or Citation
6. The earth has plenty of natural resources if we just learn how to develop them	
7. Plants and animals have as much right as humans to exist	
8. The balance-of-nature is strong enough to cope with the impacts of modern industrial nations	
9. Despite our special abilities humans are still subject to the laws of nature	
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated	
11. The earth is like a spaceship with very limited room and resources	
12. Humans were meant to rule over the rest of nature	
13. The balance-of-nature is very delicate and easily upset	
14. Humans will eventually learn enough about how nature works to be able to control it	

(*Table continues*)

Table 3-6. (*continued*)

Item	Item Source and/or Citation
15. If things continue on their present course, we will soon experience a major ecological catastrophe	

Note. Participants are instructed: "Listed below are statements about the relationship between humans and the environment. Please use the following scale to indicate how much you agree or disagree with it by circling your response." Items are measured using a 5-point scale (1 = strongly disagree, 5 = strongly agree).

The following section provides an examination and analysis of the applications of the NEP across different nations/cultures in terms of its dimensions, validity, reliability, and relationships to social psychological variables such as cultural values as well as to social structural variables such as sex, age, occupation, and education.

NEP's dimensions. The dimensions of the 12-item NEP and its shorter versions have been found to be very sample specific. For example, the NEP scale has been found to be composed of one dimension (i.e., Dunlap & Van Liere, 1978); two dimensions--human domination over nature and natural balance (i.e., Dunlap & Van Liere, 1978; Gooch, 1995); three dimensions--natural balance, limits to growth, and humans above nature (i.e., Albret, Bultena, Holberg, & Nowak, 1982; Edgell & Nowell, 1995; cited in Bechtel et al., 1999; Kuhn & Jackson, 1989; Corral-Verdugo & Armendariz, 2000; Noe & Snow, 1990) and even four dimensions (Furman, 1998). The NEP has also been found to be very culture specific. For instance, Bechtel et al. (1999) found that three dimensions emerged with Brazilian and Mexican participants while two dimensions emerged with Americans participants.

Because the NEP varies dimensionally with samples, this "could imply that culture influences the structure of environmental beliefs" (Bechtel et al., 1999, p. 123). It could also be the result of using exploratory factor analysis (EFA), since "different factorial structures as a function of the number of tests or the number of samples studied" could occur (Bentler, 1993; Gorsuch, 1983, 1988; cited in Corral-Verdugo & Armendariz, 2000, p. 28). According to Dunlap et al. (2000), another explanation for the apparent multidimensionality of the NEP scale may stem in part from the design of the scale itself in that some of the items are worded deliberately to "form a distinct dimension, [thus] reflecting the direction of their wording relative to the rest of the items" (p. 431). In view of the distinct dimensions embedded in the scale, some researchers have argued that confirmatory factor analysis (CFA) is a more appropriate statistical technique than EFA (i.e., Corral-Verdugo & Armendariz, 2000) as scale dimensions are determined beforehand. In contrast, however, Dunlap et al. (2000) stress that "the decision to treat the NEP as a single variable or as multiple variables should not be made beforehand but ought to be based on the results of the particular study" (p. 431).

In a more recent study using the updated 15-item NEP scale, Dunlap et al. (2000) found four factors resulted. However, they did not treat the new NEP scale as being composed of four sub-scales; rather, they thought the revised NEP scale to be a single measure "because all 15 items load heavily on the first *unrotated* factor" with strong item-total correlations and higher (alpha = .83) internal consistency. However, this finding does not necessarily mean that the dimensionality of the revised NEP will not vary with differing populations (Dunlap et al., 2000).

NEP's validity. Dunlap et al. (2000) analyzed the validity of the NEP scale based on past research, and found that the scale possesses criterion validity, content validity, and construct validity. In terms of criterion validity--which refers to both predictive and known-group validity--previous studies have shown that the NEP scale was significantly related to various types of behavioral intentions and self-reported or observed behaviors, suggesting that the scale is of satisfactory predictive validity. In addition, previous findings that members of environmental organizations or groups consistently scored higher on the NEP scale than did the general public or members of non-environmental interest groups suggests that the scale also has known-grown validity. Additionally, as for content validity, the three main dimensions of the NEP scale--balance-of-nature, limits to growth, and human domination over nature--were confirmed by Kempton et al. (1995) work on eliciting the environmental perspectives of Americans to be representative of environmental beliefs in terms of content. Finally, the scale's construct validity was demonstrated by: (a) the NEP being theoretically framed into a value-belief-behavior conceptual chain in which the scale "forms a primary component…of environmental belief systems", an expectation that has been empirically confirmed (Pierce et al., 1987; Stern et al., 1995; cited in Dunlap et al., 2000, p. 430); (b) the NEP was psychometrically related to other measures such as AC (Stern et al., 1995), and the ideas implied by it, according to Stern and Dietz (1994), are akin to the biospheric value, one of three value bases for environmentalism (the other two are egoistic and, altruistic values) proposed by Stern et al. (1993); and (c) in most cases, the NEP was found to be related in the expected manner to age, education, and political ideology.

NEP's reliability. One indicator of the reliability of a scale is its ability to "empirically demonstrate a potential universal scientific appeal as a measurement tool for application in a variety of social and cultural situations" (Noe & Snow, 1989, p. 21). To this end, Noe and Snow (1990) tested the reliability of the NEP scale across five samples of national park visitors having a diverse social composition. Their results indicate that the scale is consistent despite differing populations. Another indicator commonly used in the literature to measure a scale's internal reliability is Cronbach coefficient alpha. According to Nunnally (1967) a Cronbach coefficient alpha of .50 or more may be considered acceptable (cited in Gooch, 1995). In the case of the 12-item NEP scale, Dunlap and Van Liere (1978) reported that its reliability of .81 for the general population and .76 for environmental group members exceeded the aforementioned criterion. Similarly, Albrecht, Bultena, Hoibery, and Nowark (1982) also reported high NEP scale reliability, with alpha of .78 and .66 for their urban and rural samples, respectively. Finally, it appears that the revised 15-item NEP scale has even higher internal consistency than the original NEP scale, with an alpha value of .83 being found in one study (Dunlap et al., 2000).

The NEP and cultural values. Potentially, a cultural group's level of environmental concern may be deeply related to the group's cultural values. Some researchers have argued that the NEP is nothing new in non-western societies such as Japan (Pierce et al., 1987) and Nigeria (Adeola, 1996; cited in Corral-Verdugo & Armendariz, 2000). Similarly indigenous, non-industrialized societies also tend to believe in the profound connection between humanity and nature (Caldwell, 1990; Chokor, 1993; cited in Corral-Verdugo & Armendariz, 2000). Arguably, the folk ecology reflected by the NEP may be the original view of the above mentioned cultures (Corral-Verdugo & Armendariz, 2000). For instance, lower concern for the environment by African Americans is probably a function of "subcultural values arising from their African heritage, experiences of slavery, and discrimination in public parks and natural areas" (Taylor, 1989, cited in Sheppard, 1995, p. 25). Pierce et al. (1987) also stated that, "the nature of support for the NEP in Japan differs from that found in Western postindustrial nations, a difference clearly rooted in Japanese culture and tradition" (p. 76). Finally, the NEP's ideas are not unfamiliar to the Chinese, given the traditional Chinese view of the interdependence of humans and nature.

According to Pierce et al. (1987), "the meaning of support for the [NEP] is culturally based and differs from country to country, even if those countries appear to share the postindustrial development status thought to have produced the NEP" (p. 77). For instance, according to Noe and Snow (1989), the difference in Hispanic and non-Hispanic attitudes toward the environment as measured by the NEP in a general population survey, is that Hispanic respondents are more supportive of an anti-anthropocentric set of attitudes than are non-Hispanics, likely as a result of cultural differences between the two groups. In contrast, those Hispanic respondents in a field survey who shared similar environmental attitudes with their non-Hispanic counterparts had "apparently learned and/or modified their beliefs and attitudes in a manner different from that of the general Hispanic population" (p. 33) as a result of acculturation.

The NEP and social structural variables. The patterns of relationships between the NEP scale and socio-structural variables such as age, education, income, and political ideology are generally similar to those measured by other scales of environmental concern. For instance, Dunlap and Van Liere (1978) found that relationships between the NEP and age and education are very slight, "which is consistent with other findings" (cited in Caron, 1989, p. 23). Similarly, Caron (1989) found that education (in terms of degree held), income, and age are not significantly related to the NEP. Furman (1998) also observed that the NEP scale is not significantly related to any particular demographic group.

In contrast to the modest relationships of the NEP scale to the above social demographic variables, Sheppard (1995) found that race was the most consistent significant independent variable in influencing differences in scores on most of the NEP items between Whites and Blacks. The above mentioned modest relationships of the NEP scale to some social structural variables, along with Sheppard's (1995) contrasted finding provides evidence for testing relationships between the NEP scale and other social psychological variables such as acculturation and ethnicity as will be done in this study.

Summary and Conclusion

In view of its wide application to both ethnic/racial cultural groups and to the majority society, the NEP would appear to be appropriate for examining and comparing differences in environmental beliefs cross-culturally. To this end, this study will utilize the NEP (revised) scale as a measure of environmental concern for general groups--specifically Anglo-Canadians and Chinese in Canada. It is important to note, however, that there are issues associated with the use of the NEP, including: (a) the NEP was theoretically formulated and developed in the United States, and hence what it represents may not appropriate in non-western society or a group without western backgrounds such as Chinese in Canada because different countries or cultural groups may have different understandings of environmental concern (Pierce et al., 1987); (b) as relatively few comparative studies of environmental values and attitudes measured by the NEP have been conducted to examine any differences between a Chinese and a majority group, drawing upon explanations from other cultural groups needs to be done carefully; and (c) although translation of the NEP scale into other languages is not a big problem as noted earlier, several of the items have been found difficult to translate into Spanish (Noe & Snow, 1990; cited in Schultz & Zelezny, 1998). This suggests that the translation into Chinese should also be done in an equally careful manner.

Treating the NEP as a measure of general environmental attitudes or beliefs that are ranked lower than environmental values represented by biospheric-altruistic value orientation provides an opportunity to test how environmental attitudes are influenced by environmental values on the one hand, and how acculturation affects both environmental values and environmental attitudes on the other hand. However, it should be noted that the NEP, although treated as a measure of environmental attitudes in this study and most previous studies, is also viewed as a measure of values, reflecting "the ambiguity inherent in measuring [environmental attitudes]" (Dunlap et al., 2000, p. 427). As the NEP is conceptually similar to the biospheric value orientation or the man-nature value orientation, it may be anticipated that acculturation has the same effect on both the biospheric-altruistic value orientation and the NEP--if, in fact, they really do measure the same thing.

Measurement of Leisure Attitudes

According to Langenhove (1992), leisure can be measured in terms of at least three distinct psychological aspects: (a) beliefs and attitudes related to a person's satisfaction with his/her leisure experience, (b) beliefs and attitudes related to leisure in general, and (c) assessments of the quality of leisure (p. 148). In terms of "beliefs and attitudes to leisure in general", as mentioned in Section Two, four measurement techniques have been developed and used frequently in leisure research. These techniques are: (a) the Leisure Orientation Scale (Burdge, 1961), (b) the Multifactor Leisure Attitude Scale (Neulinger & Breit, 1969, 1971), (c) the Leisure Ethic Scale (Crandall & Slivken, 1980), and (d) the Leisure Attitude Scale (Ragheb & Beard, 1982). The following is an analysis of strengths and weakness of each of these measures.

The Leisure Orientation Scale

Based on the ideas of the work ethic, Burdge (1961) developed the first leisure attitude measurement. Burdge's measure consists of 11 items that focus on the contrast between work and leisure, including: such items as "I feel guilty when I'm on vacation because I am not working" and "My chief reason for working is to pay for my leisure activities." According to Crandall and Slivken (1980), however, such items "Don't allow one to have high or low affect for work and for leisure simultaneously" (p. 269). Additionally, because Burdge's scale is more work-centered, it is more like a work ethic scale than a leisure orientation scale. Finally, because this scale has been modified so much in terms of the wording of its items by successive users, "rigorous scale analysis [shows] that the scale had deteriorated considerably over time" (Yoesting & Burdge, 1976, cited in Crandall & Slivken, 1980, p. 270). Despite these shortcomings, the Leisure Orientation Scale has inspired the development of many other leisure attitude scales, including the widely used Leisure Ethic Scale (Crandall & Slivken, 1980).

The Leisure Ethic Scale

In contrast to the Leisure Orientation Scale, the big difference with the Leisure Ethic Scale is that the word "work" doesn't appear in each of its 10 items. This decision, according to Crandall and Slivken (1980), was based on the belief that "it is not necessary to dislike work in order to like leisure" (p. 271). The scale itself was developed using over one thousand people and has shown good reliability and validity. Three sub-scales were found after a factor analysis was conducted, namely liking leisure, desire for leisure time, and positive spontaneity, thus "[broadening] the leisure ethic concept even further" (Crandall & Slivken, 1980, p. 272).

Although this scale is more soundly conceptualized and worded than the Leisure Orientation Scale, it does not mean that it works well for all groups, especially those with different cultural traits. For instance, in comprising leisure attitudes among 17 different ethnocultural groups, Hall and Rhyne (1989) found that the item "I don't feel guilty about enjoying myself" confused respondents in the pre-test as "respondents had difficulty understanding what disagreeing with this negatively worded item actually meant" (p.136). This item was subsequently changed to "I feel guilty about enjoying myself," which appears to work better than the original one.

Unfortunately, however, both of these previous scales only focus on one aspect of leisure attitudes--that is, affective responses toward work and leisure. Although the work versus leisure ethic is the central aspect of leisure attitudes, by doing it this way, an attitude was viewed to be composed of only one component (i.e., affective), and thus leisure attitudes were treated as being one-dimensional. As leisure attitudes are multidimensional, however, a scale that is also multidimensional could measure an individual's leisure attitudes more effectively. The Multifactor Leisure Attitude Scale (Neulinger & Breit 1969, 1971) is such a measure.

The Multifactor Leisure Attitude Scale

The initial version of the Multifactor Leisure Attitude Scale was composed of 68 items, subdivided into seven distinct leisure attitudes: (a) amount of work or vacation desired, (b) society's role in leisure planning, (c) self-definition through work or leisure, (d) amount of perceived leisure, (e) autonomous versus passive leisure pursuits, (f) affinity to leisure, and (g) importance of public approval (Neulinger & Breit, 1969, p. 257). This scale was subsequently remodified so as to include only 32 items in its final version, with two sub-scales--autonomous versus passive leisure pursuits and importance of public approval being deleted.

The Multifactor Leisure Attitude Scale has been criticized, however. For instance, Crandall and Slivken (1980) have doubts about its content validity, and state that, "we have no idea how important these five factors are among possible leisure attitudes" (p. 267). They also argue that the scales appear to be related to the external locus of control, and thus "counter to the definition of leisure as being intrinsic" (p. 267). Further, they contend that because items are answered using many different formats, the results are awkward to score. Finally, Crandall and Slivken state that "little psychometric evidence has been provided to support the use of each scale as a separate measure" (p. 268).

The Leisure Attitude Scale

Unfortunately, because the leisure attitude scales described above do not consider all three components of attitude--affective, cognitive, and behavioral--their ability to measure a person's leisure attitudes properly is open to question. Thus, because the

Leisure Attitude Scale (Ragheb & Beard, 1982) recognizes all three leisure attitudes components, it has become the most widely used leisure attitude measure.

The Leisure Attitude Scale is composed of 36 items, with 12 items measuring each of the three of leisure attitude components. Research (Ragheb & Beard, 1982) indicates that this measure demonstrates a high level of reliability, with alpha reliability coefficient being .94 for the total scale, and .91, .93, and .89 for the cognitive, affective and behavioral, respectively. The scale also appears to have a high content validity level, based on its evaluation by 31 experts in the areas of leisure attitudes and social psychology.

The Leisure Attitude Scale's cognitive component measures an individual's general knowledge and beliefs about leisure, including its characteristics, virtues, and its relationship to the quality of life. Although these 12 items are appropriately worded, some may need refining. For instance, the phrase of "leisure activities" is used in most of 12 items and, potentially, it could be more appropriate to change it to "leisure pursuits" as this does not predefine leisure as an activity, and it also implies that an individual's intention is to be at leisure. For example, item 12 "Leisure activities are important," if changed as recommended, would become "Leisure pursuits are important," while items 4 and 5 would become "Leisure pursuits contribute to one's health", and "Leisure pursuits increase one's happiness", respectively.

The Leisure Attitude Scale's affective component measures individuals' feelings about leisure, and to what extent they like or dislike leisure activities and experiences. It can be assumed that one may like a leisure activity and experience but still place less value on it. For instance, one may find watching TV interesting, but place little value on it (Mannell & Kleiber, 1997). Another example is that, the traditional indoor leisure activity, *Majiang* (麻将), is very popular among Chinese adults. However, there are few Chinese who will admit that playing *Majiang* (麻将) is important to their life. In this sense, item 15 "I value my leisure activities" will offset scores on item 23 "I like my leisure activities," if one likes one activity but places less value on it. Moreover, this item is somewhat similar to item 12 (i.e., "Leisure activities are important"), which is part of the cognitive sub-scale. Traditionally Chinese emphasize hardwork and achievement, and hence, less value is placed on play or leisure (which is traditionally considered "idle hand" or "not doing the right thing", as discussed above). For instance, in a recent research study of Chinese experience of *rumi* (入迷) (absorption) conducted by Walker and Deng (2004), a number of Chinese participants felt guilty about enjoying themselves. Therefore, item 15 will be replaced by "I feel guilty about enjoying myself"(Hall & Rhyne, 1989), which is adopted from Crandall and Slivken's (1980) Leisure Ethic Scale.

Another important aspect in terms of the wording of the affective component is that, according to G. J. Walker (personal communication, Dec.15, 2001), some of the items seem more like a measure of a leisure experience than feelings about leisure (i.e., item 13 "When I am engaged in leisure activities, the time flies"; item 16 "I can be myself during my leisure"). In order to correct this problem, some words such as pleasant/unpleasant, or interesting/uninteresting may be more appropriate for expressing one's feelings about leisure. Thus, for instance, item 17 "My leisure activities provide me with delightful experiences, might become "My leisure activities are interesting."

Finally, in regard to the behavioral component of the Leisure Attitude Scale, this set of items is generally used to understand an individual's past, present, and intended leisure activities and experiences. However, a large difference in the responses of Chinese in Canada and Anglo-Canadians may be found in this part of the measure because immigrants are usually busy with studying, training, and finding a job, and so they tend to have more constraints on their leisure activities. Although this difference may be reflected by the following two items, "I do leisure activities frequently" (item 25) and "I spend considerable time and effort to be more competent in my leisure activities" (item 29) other items (i.e., items 26, 27, and 28) used to measure intended actions may have fewer differences in responses as they are less affected by constraints.

In conclusion, although some modifications are necessary, the Leisure Attitude Scale appears to be a more appropriate choice for measuring leisure attitudes than the other three scales that were examined, as it includes all three leisure attitudes components. Furthermore, because this, it may also be possible to determine to what extent acculturation may influence one, two, or all three, leisure attitude components. Finally, while a shortened version of the LAS does not exist because of length concern, one will be created for this study. Specifically, the eight items that loaded the highest on each of the three components when Ragheb and Beard (1982) factor analyzed the completed scale will be used (see Table 3-7).

Table 3-7

Leisure Attitudes Scale Items

Item	Item Source and/or Citation
1. Leisure pursuits are beneficial to individuals and society	All items except item 11 are adopted from Ragheb and Beard (1982); item 11 used here is adopted by Hall and Rhyne (1980) from Crandall and Slivken's (1980) Leisure Ethic Scale.
2. Leisure pursuits contribute to one's health	
3. Leisure pursuits increase one's happiness	
4. Leisure increases one's work productivity	
5. Leisure pursuits help to renew one's energy	
6. Leisure pursuits can be a means for self-improvement	
7. Leisure pursuits help individuals to relax	
8. People need leisure pursuits	
9. My leisure pursuits give me pleasure	
10. My leisure pursuits are exciting	
11. I feel guilty about enjoying myself	
12. I can be myself during my leisure	
13. My leisure pursuits are interesting	
14. My leisure pursuits are refreshing	
15. I like my leisure pursuits	
16. My leisure pursuits absorb or get my full attention	

(*Table continues*)

Table 3-7. (*continued*)

Item	Item Source and/or Citation
17. I buy goods and equipment to use in my leisure pursuits as my income allows	
18. I spend considerable time and effort to be more competent in my leisure pursuits	
19. Given a choice I would live in an environment or city which provides for leisure	
20. I would attend a seminar or a class to be able to do leisure pursuits better	
21. I support the idea of increasing my free time to engage in leisure pursuits	
22. I engage in leisure pursuits even when I am busy	
23. I would spend time in education and preparation for leisure pursuits	
24. I give my leisure high priority among other pursuits	

Note. Participants were instructed: "Listed below are statements about your attitudes toward leisure. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response." Items are measured using a 5-point scale (1 = strongly disagree, 5 = strongly agree).

Data Analysis

Three types of statistical analyses will be conducted as part of this study: (a) factor analysis, (b) multiple analysis of covariance (MANCOVA) and, if necessary, analysis of covariance (ANCOVA), and (c) multiple regression analyses.

Factor Analysis

The purposes of factor analysis are to: (1) ascertain the factor structure among a set of variables, and (2) achieve data reduction and obtain factor scales, which can be used as variables that will be analyzed along with other variables (Kim & Mueller, 1978a). In the case of the former, the use of raw variables is appropriate, while in the case of the latter, the use of standardized variables is appropriate (Kim & Mueller, 1978b). Because the purpose of this study is to compare the similarities and differences in attitudes toward national parks, the environment, and leisure, the first step is to find the common factors that exist between Anglo-Canadians and Chinese, and then conduct analyses based on these common factors or latent variables. Therefore, all data will be first standardized (*z*-score) per cultural group when conducting factor analysis. Moreover, because previous studies have indicated that Chinese tend to select the middle range of a scale (Yang, 2002). As a result, standardizing the raw scores could reduce or eliminate the unwanted cross-cultural differences due to such response bias (Vijver & Leung, 1997), and increase the agreement of the potential common factors between the two groups.

In terms of determining the common factors between the two groups, one approach is to conduct factor analysis for each cultural group sperately (Vijver & Leung, 1997). One shortcoming of this approach is that each cultural group could have a set of factors that are different from the other group, which make any type of comparison difficult.

Alternatively, simultaneous components analysis has been proposed by Kiers and Ten Berge (1989) and others (cited in Vijver & Leung, 1997), where "a single set of principal components for all groups is estimated that maximizes the proportion of variance over all groups" (Vijver & Leung, 1997, p. 99). In so doing, the factors obtained are identical across groups (Vijver & Leung, 1997). Because of the unavailability of such a computer program, this study will follow previous studies (e.g., Hasegawa & Gudykunst, 1998) and factor analyze the combined data.

Two types of factor analysis--exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)--have been widely used by social scientists to discover the factorial structures among diverse measures. EFA is used to elicit unspecified factors while CFA is usually used to test explicit hypotheses. Despite this distinction, there is relatively little agreement among social scientists on which type of factor analysis is most appropriate in examining factors for a particular measure. Some researchers argue that EFA capitalizes on chance, a shortcoming that could "produce different factorial structures as a function of the number of tests or the number of samples studied" (Bentler, 1993; Gorsuch, 1983, 1988; cited in Corral-Verdugo & Armendariz, 2000, p. 28). In contrast, CFA "does not present the problem of capitalization on chance; thus, its results are more stable than those of EFA" (Corral-Verdugo & Armendariz, 2000, p. 28). Others have argued in support of the use of exploratory factor analysis, since rotation is used in EFA and each factor is orthogonal to each other and is not correlated with another. As a result, this "technique is commonly used to test for unidimensionality among scale items" (Noe & Snow, 1989, p. 23). For this study, as the nature of studied subjects such as Chinese are usually unexplored, EFA is applied to reduce the data and identify potential factors of measures involving acculturation, national parks, the environment, and leisure. Another advantage of using EFA in this study is that there is an opportunity to compare the factor analytic solutions with those found in past studies, most of which used EFA.

The principal components method with varimax rotation--the most common method (Tabachnick & Fidell, 1996)--will be used. An eigenvalue of over 1.00, which was used by most researchers as a rule-of-thumb for identifying the potential factors, and a factor loading of over .45 (20% overlapping variance), which was thought to be fair for interpretating variables according to Comrey and Lee (1992) will be used in this study. In addition, a loading of .10 will be used to separate the primary and secondary loadings (cf. Hasegawa & Gudykunst, 1998).

Multiple Analysis of Covariance and Univariate Analysis of Covariance

Analysis of variance, analysis of covariance, and regression analysis are often used in cross-cultural studies (Vijver & Leung, 1997). Comparatively, analysis of covariance is the most appropriate for this study, because: (1) the sampling method used in this study cannot conclude whether the cultural differences observed are due to valid cultural differences or to noncontrolled differences (e.g., age, education, income, etc.) (Vijver & Leung, 1997); (2) the demographic variables can be statistically controlled by treating them as covariates when cultural comparisons are made under the difficulty of matching subjects with similar demographic characteristics across cultural groups (Vijver & Leung, 1997). According to Vijver and Leung (1997, p. 119), "covariance analysis is highly useful in cross-cultural research because of the frequent presence of …experimentally uncontrollable differences; (3) Sue and Sue (1977) argued that socio-demographic characteristics should be taken into account when ethnic minorities are included as research participants. However, many cross-cultural studies ignore sample differences across cultures and their conclusion may not hold in cross-validations (Vijver & Leung, 1997); and (4) the violation of the assumptions of homogeneity of variance-covariance and homogeneity of regression has very little effect upon the probability of a Type I error in an analysis of covariance (Glass, Peckham & Sanders, 1972). In addition, Pechman (1968) reported that the robustness continues to hold in quasi-experimental settings, where the distributions of the covariate means differ by treatment groups (cited in Wildt & Ahtola, 1978).

Finally, MANCOVAs will first be performed on factor scales obtained from measures on national parks, the environment, and leisure. For analyses on ethnicity, if a MANCOVA is significant, ANCOVA on each scale's individual dimensions will follow, using the independent variables appropriate for each hypothesis. For analyses on acculturation, if a MANCOVA is significant, pairwise comparisons of simple main effects or/and interaction effects will follow. Finally, in order to reduce the likelihood of a Type I error, the Bonferroni technique (Huck & Cormier, 1996) will be used for post hoc analyses (i.e., for analyses on ethnicity, a = .05/p, where p is the number of dependent variables; for analyses on acculturation, a = .05/c, where c is number of pairwise comparisons).

In terms of the dependent variables (i.e., sub-scales obtained from factor analysis), there are two approaches for calculating the score of a dependent variable. One is to add up the raw scores of all items under a factor scale and then to take the average as the score of the factor scale. The alternative approach is to calculate the mean score of a factor scale based on the standardized scores rather than the raw scores. While the standardization of the raw variables may reduce the cultural difference due to response sets, it may also underestimate the real difference across groups when the difference is valid and there is no justification that there exists difference due to response sets (Vijver & Leung, 1997). Likewise, raw scores could create difference across cultural groups if the difference is due to response sets. As will be shown in the descriptive analyses on attitudes toward the three aeras in research results section, Chinese tend to choose the middle ones along a spectrum of choices. It seems that standardization could be appropriate in this study. However, as aforementioned it may reduce the real difference because: (1) currently there are no methods that have been developed to test statistically to what extent differences due to response sets will impact the real cultural difference at a significant level, and (2) it is difficult to determine, in a given study, if Chinese respondents do not report their real intention (Yang, 1993). In view of this, raw scores will be used for MANCOVAs and ANCOVAs. If a difference due to response sets does exist between both groups-Anglo-Canadians and Chinese, the Bonferroni approach can eliminate such a difference by increasing the possibility of rejecting the null hypotheses.

Summary and Conclusion

This section mainly addresses the three topics of data collection, measures, and data analysis. As for data collection, advance telephoning followed by a mail-out will be utilized. Making advance phone calls is indispensable as it screens out participants who are unsuited for the purposes of this study. At least 300 copies of questionnaires will be mailed out to each of the two groups: Chinese from mainland China and Anglo-Canadians, in the hope of getting at least 150 completed ones back for each group. Data analyses will draw upon seven measures as discussed in this section in regards to acculturation, national parks, the environment, and leisure. Three of these--the Environmental Value Scale, the NEP, and Leisure Attitudes Scale--are well established and widely used. The other three--Acculturation Measurement Scale, National Park Function and Role Scale, and Appropriate Use Scale--are developed based on a substantial review of literature. It is safe to say that all of these measures are theoretically sound and provide a valid and reliable basis for data analyses--which will be carried out using factor analysis, MANCOVAs, and ANCOVAs.

Although the research methods discussed in this section appear to be appropriate and acceptable, like many other social studies, this study is not without its limitations. First, ethnic groups, such as the Chinese in Canada, are not homogeneous (Li, 1998), and invariably demonstrate intra-group differences, even though Chinese who have immigrated to other parts of the world have their roots in mainland China (Li, 1998). For example, it is likely that Chinese from mainland China retain more traditional Chinese culture than Chinese from Hong Kong, Singapore, and Taiwan which are more democratic and westernized than the former (Yu & Berryman, 1996). In view of this heterogeneity, an intra-group attitude comparison between/among Chinese from mainland China and Chinese from Hong Kong or Taiwan or other adopted countries/regions will be more meaningful in revealing the whole picture of attitude variations, if any, among these Chinese subgroups. Second, potential Chinese participants identified by Hanyu pinyin are probably those who arrived in Canada after 1958, suggesting that acculturation or assimilation has not entirely occurred. Finally, "due to the translation of research instruments into Chinese, deeper meaning of individual questions may not have been parallel to the English version" (Hsieh, 1998, p. 4). For instance, such English words as "preservation", "conservation", and "protection" are more than often than not translated into two Chinese characters "*baohu*" (保护). Therefore, comparison between the two groups may be unintentionally inaccurate.

CHAPTER FOUR

RESEARCH RESULTS

This chapter consists of five sub-sections. The first sub-section provides a profile of the socio-demographic characteristics of the respondents from the study populations, Anglo-Canadians and Chinese. Sub-section two presents the classification results of Chinese respondents according to their acculturation levels. The third, fourth, and fifth sub-sections deal with the three different themes of this study--national parks, the environment, and leisure, respectively. Each of these three sub-sections presents and discusses the response frequency, mean and standard deviation of responses, the results of factor analyses, and the results of MANCOVAs, ANCOVAs, and pair comparison tests.

As indicated in the introduction section, fourteen hypotheses involving ethnicity and acculturation will be tested in this study. These hypotheses are categorized into two sets. The first set of hypotheses examine if there exist similarities and differences in attitudes toward national parks, the environment, and leisure between the two groups. These hypotheses are:

H1: There exist significant differences in attitudes toward the revised policy of national parks between Chinese in Canada and Anglo-Canadians.

H3: There exist significant differences in attitudes toward the roles and functions of national parks between Chinese in Canada and Anglo-Canadians.

H5: There exist significant differences in attitudes toward appropriate use of Canada's national parks between Chinese in Canada and Anglo-Canadians.

H7: There exist significant differences in environmental values between Chinese in Canada and Anglo-Canadians.

H10: There exist significant differences in attitudes toward the environment between Chinese in Canada and Anglo-Canadians.

H12: There exist significant differences in leisure attitudes between Chinese in Canada and Anglo-Canadians.

H14: Leisure attitudes held by Anglo-Canadians are more positively valued than is the case of Chinese in Canada.

The second set of hypotheses examine if Chinese with a higher level of acculturation will exhibit no significant differences in the three types of attitudes when compared with their Anglo-Canadian counterparts. These hypotheses are:

H2: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the revised policy of Canadian national parks.

H4: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the roles and functions of Canadian national parks.

H6: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of appropriate use within Canadian national parks.

H8: The more acculturated Chinese are, the more similar their environmental values will be to those of Anglo-Canadians.

H9: The less acculturated a Chinese, the higher retention of his or her traditional values.

H11: The more acculturated Chinese are, the more similar their environmental attitudes will be to those of Anglo-Canadians.

H13: The greater level of acculturation a Chinese person has, the more likely his or her leisure attitudes will be similar to those of Anglo-Canadians.

Response Rate and Return Rate

Response Rate

Data collection, from the first advance phone call to the last questionnaire being received spanned three and a half months (November 1, 2002-February 15, 2003). For Anglo-Canadians, 600 households were randomly selected from a total of 22,403 Anglo-Canadian households in Edmonton. Following elimination of ineligible households (see Fowler, 1993), 397 households remained. Of the 397 households contacted by telephone, 210 households were willing to participate (Table 4-1) with the willingness to participate rate being 52.9%. The predominant reasons given for not being willing to participate were that people were not interested or they did not have time to participate in the survey.

For Chinese respondents, 400 Edmonton households were randomly selected out of 3,787 households whose family names and given names are spelled using the Hanyu pinyin system, and 200 out of 477 households whose family names are spelled using the Hanyu pinyin while their given names were English. Following a similar elimination approach to that used for Anglo-Canadians, a total of 391 households remained. Of this number, 223 households were willing to participate (Table 4-2) with the willingness to participate rate being 57.0%. The main reasons given for not being willing to participate were that people did not have time to participate (13.8%), they were not interested (6.2%) or they could not communicate in Mandarin (5.2%).

Table 4-1

Outcome of Advance Phone Call for Anglo-Canadians

	Total	Percent
Eligible		
Not interested	172	28.7
No time	15	2.5
Participants	210	35.0
Subtotal	397	66.2
Ineligible		
No answer	88	14.7
Not in service	47	7.8
Wrong number	43	7.2
Fax line	11	1.8
Wrong ethnicity	13	2.2
Other	1	0.2
Subtotal	203	33.9
Total	600	100.1

Note. The total percentage is not 100 due to rounding.

Table 4-2

Outcome of Advance Phone Call for Chinese in Canada

	List 1	List 2	Total	Percent
Eligible				
Not interested	13	24	37	6.2
No time/not willing/cannot help	36	47	83	13.8
Cannot communicate	21	10	31	5.2
Do not understand	16	1	17	2.8
Participants	177	46	223	37.2
Subtotal	263	128	391	65.2
Ineligible				
No answer	54	43	97	16.2
Not in service	29	0	29	4.8
Wrong number	19	9	28	4.7
Fax line	1	3	4	0.7
Wrong group	19	9	28	4.7
Others	15	8	23	3.8
Subtotal	137	72	209	34.9
Total	400	200	600	100.1

Note. 1. List 1 refers to those Chinese participants whose given names and surnames are spelled in Hanyu pinyin while list 2 refers to those Chinese participants whose given names are English but surnames are spelled in Hanyu pinyin. 2. The total percentage is not 100 due to rounding.

Return Rate

For Anglo-Canadians, a total of 160 usable questionnaires were returned, resulting in a return rate of 76.2%. In the case of Chinese, a total of 198 usable questionnaires were returned, resulting in a return rate of 88.8%. Of these questionnaires, 12 were filled out by Chinese who were originally from Hong Kong, and eight were filled out by Chinese who were originally from Vietnam, Malaysia, Taiwan, or other countries. Thus, a total of 178 questionnaires were filled out by Chinese from mainland China. As this study is concerned with Chinese who were originally from mainland China, only the results from these 178 questionnaires are used in the data analysis. Finally, it should be noted that the overall return rate was 40.3% (i.e., 160/397 = .403) for Anglo-Canadians and 50.6% (i.e., 198/391 = .506) for Chinese, respectively.

Socio-demographic Characteristics

Anglo-Canadians

As Table 4-3 illustrates, of the 160 Anglo-Canadian participants, 71 (44.4%) are females and 86 (53.8%) are males with three (1.9%) participants not identifying their sex. In addition, 115 (72.3%) were married or had common law partners and 44 (27.7%) were single. About half of the participants (51.1%) are between 40 and 59 years of age (Table 4-4). Most of the participants (89.4%) were born and grew up in Canada and the remainder (10.6%) were born in the British Isles, the United States, and other countries (i.e., Jamaica, Gibraltar, Brunei, and Chile). They all identified themselves as being Anglo-Canadians (Table 4-5). In terms of education level, 35.4% of them have a high school diploma or equivalent and 46.9% have an undergraduate or post-secondary degree. A small percentage of participants have less than a high school diploma (7.6%) or a graduate school degree (9.5%). As far as for income is concerned, 27.6% of participants have a family income of between $50,000 and $74,999, 40.8% and 31.6% of participants have a family income under $49,999 and over $100,000, respectively (Table 4-6).

Table 4-3

Socio-demographic Characteristics of Respondents-Sex and Marital Status

Category	Anglo-Canadians No. (%)	Chinese No. (%)
Sex		
Female	71 (44.4)	76 (42.7)
Male	86 (53.8)	102 (57.3)
Not identified	3 (1.9)	0 (0.0)
Marital status		
Single	44 (27.7)	22 (12.4)
Married/partner	115 (72.3)	156 (87.6)

Note. 1. The total number for each category is not always 160 for Anglo-Canadians and 178 for Chinese due to missing values. 2. The total percentage for each category is not always 100 due to rounding.

Table 4-4

Socio-demographic Characteristics of Respondents-Age

Category	Anglo-Canadians No. (%)	Chinese No. (%)
Age		
18-29	20 (12.5)	24 (13.7)
30-39	28 (17.5)	75 (42.9)
40-49	46 (28.8)	57 (32.6)
50-59	37 (23.1)	13 (7.4)
60-69	18 (11.3)	3 (1.7)
70 and over	11 (6.9)	3 (1.7)

Note. 1. The total number for each category is not always 160 for Anglo-Canadians and 178 for Chinese due to missing values. 2. The total percentage for each category is not always 100 due to rounding.

Table 4-5

Socio-demographic Characteristics of Respondents-Birthplace, Ethnicity and Length of Residence

Category	Anglo-Canadians No. (%)	Chinese No. (%)	Mean (Years)
Birth place			
Canada	143 (89.4)	12 (6.7)	
British Isles, USA, etc.	17 (10.6)	-	
Mainland China	-	166 (93.3)	
Ethnicity			
Anglo-Canadians	160 (100.0)	-	
Chinese	-	97 (55.4)	
Canadian Chinese	-	70 (40.0)	
Canadian	-	8 (4.6)	
Length of residence			9.5
First generation	-	161 (92.0)	
Second generation and over	-	14 (8.0)	

Note. 1. The total number for each category is not always 160 for Anglo-Canadians and 178 for Chinese due to missing values. 2. The total percentage for each category is not always 100 due to rounding. 3. Second generation refers to those who were born in Canada or emigrated to the country as a child with their parents (cf. Dion & Dion, 1996).

Table 4-6

Socio-demographic Characteristics of Respondents-Education and Income

Category	Anglo-Canadians No. (%)	Chinese No. (%)
Education		
Less than high school	12 (7.6)	7 (4.0)
High school or equivalent	56 (35.4)	25 (14.1)
Undergraduate or post-secondary degree	75 (47.5)	63 (35.6)
Graduate school degree	15 (9.5)	82 (46.3)
Income		
Under $24,999	16 (10.5)	36 (22.0)
$25,000 - $49,999	46 (30.3)	45 (27.4)
$50,000 - $74,999	42 (27.6)	52 (31.7)
$75,999 - $99,999	21 (13.8)	19 (11.6)
Over $100,000	27 (17.8)	12 (7.3)

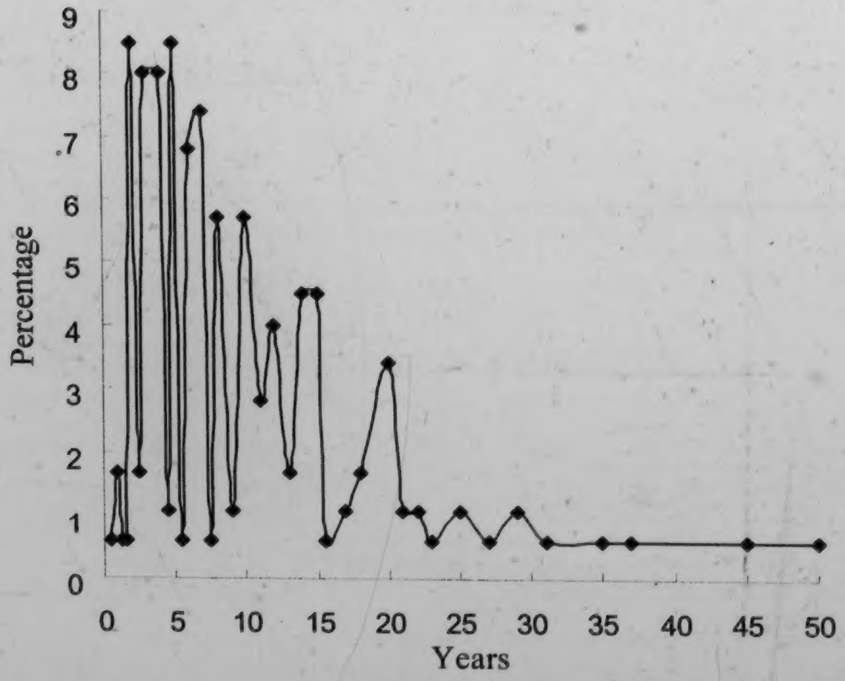
Note. 1. The total number for each category is not always 160 for Anglo-Canadians and 178 for Chinese due to missing values. 2. The total percentage for each category is not always 100 due to rounding. 3. Income refers to Canadian dollars.

Chinese Respondents

Table 4-3 also indicates that of the 178 Chinese participants, 76 (42.7%) are females and 102 (57.3%) are males. The majority of participants (87.6%) were married or had common law partners. In contrast, only 12.4% were single. Most of the participants

(75.5%) are between 30 and 49 years of age (Table 4-4). In addition, 93.3% of Chinese respondents were born in mainland China and only 6.7% were born in Canada. A large number of Chinese (92.0%) identified themselves as being first generation and only 8.0% identified themselves as being second generation or over. About one half of the Chinese respondents (54.5%) identified themselves as being Chinese, and 40.0% being Chinese Canadians. A relatively small percentage of Chinese (4.6%) identified themselves as being Canadians (Table 4-5). Most of the Chinese respondents had arrived in Edmonton within the past 10 years (Figure 4-1). The reported length of residence in

Figure 1. Frequency of Length of Residence of Chinese in Edmonton



Canada ranges from a few months to 50 years with the average length of residence being about 9.5 years (Table 4-5). As for family income, the majority of Chinese respondents tend to have a middle to low to middle level of income with 31.7% and 49.4% having an income from $50,000 to $74,999 and under $49,999, respectively. Those who have a family income over $75,999 account for 18.9% of the total participants (Table 4-6). In terms of education, Chinese participants have a higher level of education with 35.6% having undergraduate/post-secondary degree and 46.3% having a graduate school degree (Table 4-6).

When the two groups of study participants are compared, both groups have relatively more male participants than female counterparts. The marriage status of the two groups is also relatively similar. However, more Anglo-Canadians are single in comparison to their Chinese counterparts. Despite these two similarities, the two groups do exhibit distinct differences in age, education, and income. For instance, Anglo-Canadians tend to be older and to have lower levels of education and higher levels of income than their Chinese counterparts. This result is consistent with the recent 2001 Canada census which found that 41% of working age (25-64) immigrants who arrived in the 1990s were university trained. In contrast, only 23% of Canadians had university degrees (Statistics Canada, 2003c). While immigrants were well-educated, they also tended to have lower income than their Canadian counterparts. For instance, the average income in 2000 of male and female immigrants aged 24 to 54 who arrived during the same decade are 25% and 24% lower than those of Canadian-born individuals (Statistics Canada, 2003d).

Acculturation of the Chinese Living in Edmonton

This sub-section will initially examine the construct validity of the acculturation measure developed for Chinese in Canada using factor analysis. Second, the reliability of the measure will be examined based on Cronbach's coefficient alphas. Finally, Chinese respondents will be classified into three subgroups with different levels of acculturation.

Data Screening

Prior to factor analysis and MANCOVAs on acculturation, three of 178 cases were deleted as one of them had 19 missing values while the other two had 16 missing values. In addition, 16 cases had either one (13 cases) or two (3 cases) missing values. These missing values will be replaced by their corresponding means because: (1) these missing values scattered randomly through the 24 acculturation items; and (2) 13 out of the 16 cases had only one missing value (less than 5%). According to Tabachnick and Fidell (1996), the problems are less serious with 5% missing values in a random pattern from a large data set.

Construct Validity

Before classifying Chinese respondents according to their acculturation levels, it is essential to examine the construct validity of the measure. Factor analysis is useful for examining the construct validity of an empirical measure (Carmines & Zeller, 1979; Nunnally, 1978; Ponterotto, 1996; cited in Ponteroto et al., 1998). As discussed in the methods section, raw scores are more appropriate than standardized scores when the factor structure is examined. To this end, factor analysis was performed on the raw scores of the acculturation measure. An eigenvalue of over 1.00 and a factor loading of over .45 (20% overlapping variance) are used to identify latent variables. In addition, a loading of .10 will be used to separate the primary and secondary loadings. The results are presented in Table 4-7 and Table 4-8.

Table 4-7

Principal Components Analysis (Using Varimax Rotation) of Acculturation

	Factor						
Category	1	2	3	4	5	6	7
Eigenvalue	5.42	2.01	1.81	1.53	1.27	1.23	1.12
Percent of variance	22.6	8.4	7.5	6.4	5.3	5.1	4.7
Cumulative percent	22.6	31.0	38.5	44.9	50.2	55.3	60.0
1. I was raised in a way that was Chinese	.27	.09	.03	**.62**	.30	.04	.06
2. I am proud of Chinese culture	-.16	.35	.33	**.48**	.31	-.36	.01
3. I believe that my children should read, write, and speak Chinese	-.21	**.57**	.10	.25	.10	-.08	.10
4. I would prefer to live in a Chinese/ Chinese Canadian community	.35	.18	.20	-.14	-.03	**-.56**	.02
5. I prefer to go to Chinese restaurants for friend gatherings	**.65**	.26	.15	.00	.11	-.22	.07
6. My friends are Chinese/Chinese Canadians	**.74**	.17	.03	.10	.05	-.04	.07
7. Overall, I am Chinese	.47	.19	.06	**.57**	.04	.10	.06

(*Table continues*)

Table 4-7. (*continued*)

Items	Factor						
	1	2	3	4	5	6	7
8. Given a choice, I would prefer to go to Chinese social occasions to mainly White gatherings	**.79**	.23	-.02	.06	.16	-.07	-.10
9. When I am around White people, I am conscious of being "different"	**.69**	.02	-.10	-.03	.08	.18	.06
10. I sometimes wish I could be White instead of being Chinese	.20	-.09	-.03	**-.63**	.30	-.04	-.08
11. I prefer to eat Chinese food at home	.30	.25	.21	.23	.24	**.63**	-.04
12. When one receives a gift, one should reciprocate with a gift of equal or greater value	.06	.00	-.02	-.12	**.85**	.03	.00
13. One needs not achieve academically to make one's parents proud	.01	.30	.16	-.16	.06	-.03	**-.72**
14. One should be humble and modest	.10	.22	.15	-.02	.06	-.01	**.79**
15. I prefer to speak in Chinese	.46	**.66**	-.05	.13	.02	.09	.14
16. I prefer to read in Chinese	.46	**.72**	.02	.13	-.10	.11	.00

(*Table continues*)

Table 4-7. (*continued*)

Items	Factor 1	2	3	4	5	6	7
17. I prefer to write in Chinese	.42	**.74**	.11	.09	-.07	.06	-.05
18. I prefer to listen to Chinese music	.24	**.69**	-.09	-.10	.13	.05	-.06
19. I will financially support (or currently do support) my parents when they are old	.03	.31	.14	.03	.35	.12	**.47**
20. I am a frequent Western church goer	.07	-.02	-.41	**.49**	-.01	.03	.00
21. I celebrate Chinese holidays	.24	.06	.08	.15	**.53**	-.21	.03
22. I feel that my relationships with others aremore important than my accomplishments	-.09	.01	**.83**	.06	-.01	.10	-.06
23. I enjoy being unique and different from others in many respects	.00	.12	-.04	-.05	-.18	**.66**	.08
24. It is important to me to consider my friends' opinions before I act	.18	.01	**.73**	-.01	.08	-.18	.13

Note: 1. Loadings of 0.45 and above are in bold. 2. Difference of 0.10 was used to separate the primary and secondary loadings. 2. Missing values were replaced by the respective mean of each variable.

Seven factors emerged from the factor analysis of the 24 items measuring Chinese respondents' acculturation (Table 4-7). These seven factors explained, cumulatively, 60.0% of the variance. As indicated in Table 4-8, factor one includes four items (i.e., items 5, 6, 8, and 9), accounting for 22.6% of the variance. This factor reflects the social interactions of Chinese respondents. The internal consistency of this sub-scale is .79. Factor two has five items (i.e., items 3, 15, 16, 17, and 18), accounting for 8.4% of variance. This factor can be labeled "language preference." The internal consistency is .81. Factor three has two items (i.e., items 22 and 24) and accounts for 7.5% of the variance. This factor measures distinct cultural value between the Western and Eastern societies--self-construal (Markus & Kitayama, 1991). The internal consistency of this factor is .58. Factor four has five items (i.e., items 1, 2, 7, 10, and 20) accounting for 6.4% of the variance with an internal consistency of .51. This factor can be labeled "ethnic identity." Item 20 was included on this factor despite the fact that the difference between the primary and secondary loading is less than .10. However, the difference between the two is .08, which is sufficiently close to the criterion. Factor five includes two items (i.e., items 12 and 21) and accounts for 5.3% of the variance with internal consistency of .45. This factor can be labeled "gift giving and holiday celebration." Factor six has three items (i.e., items 4, 11, and 23), accounting for 5.1% of the variance with internal consistency of .49. This factor can be labeled "food and community preference." Finally, factor seven consists of three items (i.e., items 13, 14, and 19) and accounts for 4.7% of the variance with internal consistency of .38. This factor is labeled "filial piety."

Seven factors have been extracted from the acculturation measure. These factors reflected different dimensions of acculturation such as social interactions, which accounted for the majority of the variance, reflecting the role of social interactions in the process of acculturation as discussed in the methods section; language preference, ethnic identity, and other cultural traits (i.e., self-construal, filial piety, food preference, and holiday celebration). There exist considerable similarities in factor structure when compared to the well developed and widely used acculturation measure-the Suinn-Lew Asian Self-identity Acculturation Scale (SL-ASIA). For instance, Suinn et al. (1992, 1995) reported five interpretable factors that emerged from the SL-ASIA. They are reading, writing, and cultural preference, ethnic interaction, affinity for ethnic identity and pride, generational identity and food preference. Similarly, seven factors emerged from the same measure in a study conducted by Kodama and Canetto (1995). These factors are: cultural/language preference and ethnic interaction, ethnic identity, written language, ethnic involvement and pride, ethnicity of friends up to age 18, food preference, and spoken language. Due to the use of different items, the acculturation measure developed in this study does not completely match with the SL-ASIA. However, as exhibited above, the two measures did converge in terms of factor structure. Therefore, the structure of the measure was validated.

Table 4-8

Acculturation Factor Loadings and Scale Cronbach's Coefficient Alphas

Factor (Proportion): Scale name & items	Loadings	*a* for raw variables	Comments
Factor 1: Social interactions (22.6%)		.79	Item deletion not necessary
5. I prefer to go to Chinese restaurants for friend gatherings	.65		
6. My friends are Chinese/Chinese Canadians	.74		
8. Given a choice, I would prefer to go to Chinese social occasions to mainly White gatherings	.79		
9. When I am around White people, I am conscious of being "different"	.69		
Factor 2: Language preference (8.4%)		.81	Item deletion not necessary
3. I believe that my children should read, write, and speak Chinese	.57		
15. I prefer to speak Chinese	.66		
16. I prefer to read in Chinese	.72		
17. I prefer to write in Chinese	.74		
18. I prefer to listen to Chinese music	.69		
Factor 3: Self-construal (7.5%)		.58	Item deletion not necessary
22. I feel that my relationships with others are more important than my own accomplishments	.83		

(*Table continues*)

Table 4-8. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for raw variables	Comments
24. It is important to me to consider my friends' opinions before I act	.73		
Factor 4: Ethnic identity (6.4%)		.51	Item deletion not necessary
1. I was raised in a way that was Chinese	.62		
2. I am proud of Chinese culture	.48		
7. Overall, I am Chinese	.57		
10. I sometimes wish I could be White instead of being Chinese	.63		
20. I am a frequent Western church goer	.49		
Factor 5: Gift giving and holiday celebration (5.3%)		.45	Item deletion not necessary
12. When one receives a gift, one should reciprocate with a gift of equal or greater value	.85		
21. I celebrate Chinese holidays	.53		
Factor 6: Food and community preference (5.1%)		.49	Item deletion not necessary
4. I would prefer to live in a Chinese/ Chinese Canadian community	.56		
11. I prefer to eat Chinese food at home	.63		
23. I enjoy being unique and different from others in many respects	.66		

(*Table continues*)

Table 4-8. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for raw variables	Comments
Factor 7: Filial piety (4.7%)		.38	Item deletion not necessary
13. One needs not achieve academically to make one's parents proud	-.72		
14. One should be humble and modest	.79		
19. I will financially support (or currently do support) my parents when they are old	.47		

Reliability

Coefficient alpha was considered the preferred measure of internal consistency because it is the mean of all possible split-half reliabilities (Carmines & Zeller, 1979; Ponterotto & Furlong, 1985; cited in Ponterotto et al., 1998). According to Ponterotto (1996), an alpha of at least .70 is necessary for research-use instruments with large groups (cited in Ponterotto et al., 1998). The overall internal consistency measured by Cronbach's coefficient alpha is .82 for the acculturation measure used in this study, indicating that the measure has high reliability.

Acculturation Level

Four items (items 10, 13, 20, and 23) in the acculturation measure are reverse worded. The measure is designed in such a way that a low score reflects high acculturation, while a high score reflects low acculturation. In scoring the scale, a total value for each respondent is calculated by summing all 24 items. A final acculturation score is then calculated by dividing the total value by 24 (Suinn et al., 1987). As a result, a score will range from a minimum value of 1 (highest acculturation) to a maximum value of 5 (lowest acculturation).

Two methods have been widely used to classify individuals into different levels of acculturation. The first one was proposed by Suinn et al. (1987), who classified individuals into three levels: low (1.00-2.33 mean score), medium (2.33-3.66) or high (3.66-5.00). This method has been followed by a number of researchers (e.g., Atkinson & Gim, 1989; Atkinison, Lowe, & Matthews, 1995; Park & Harrison, 1995; Tata & Leong, 1994). However, depending on study designs or sample sizes, individuals can also be divided into two levels--low acculturation and high acculturation with the midscore (scores 1.00-3.00 = low-medium; scores 3.01-5.00 = high) being the dividing point (e.g., Atkinson & Gim, 1989; Park & Harrison, 1995).

The second method is to classify individuals based on mean and standard deviation (Cuellar, Arnold, & Maldonado, 1995; Lessenger, 1997). For instance, Cuellar et al. classified Mexican Americans into five levels of acculturation with standard deviation (*SD*) ranging from -1.0 *SD* (scores < mean - 1 *SD* = very Mexican oriented) to +1.5 *SD* (scores > mean + 1.5 *SD* = very assimilated or Anglicized).

The third method is to classify individuals based on percentiles. For instance, individuals can be classified into three groups according to 33, 50, and 66 percentiles.

In order to categorize Chinese respondents into different groups with varied acculturation levels, the method proposed by Suinn et al. (1987) was first tried. However, it was found that only 1 and 8 Chinese respondents fell into the high-acculturated respondent category by the three-level-classification and the two-level-classification, respectively. This would not allow a MANCOVA to be performed. Alternatively, the standard deviation method was tried. As a result, there are 20 (11.4%) and 24 (13.7%) respondents in the low and high acculturation level category, respectively, while there are

132 (74.9%) in the middle category. This outcome generally reflected the acculturation patterns of Chinese in Canada. For example, according to Goldmann (1998), 8.4% of the Chinese in Canada were assimilated (high acculturation), 74.5% were integrated (middle), and 17.1% were segregated (low acculturation). However, the sample size for the high acculturation group and low acculturation group is too small to achieve a satisfactory statistical power. As a tradeoff, two levels of acculturation can be adopted, where those whose average score is less than the mean value of 3.75 can be classified as being high acculturated while those whose average score is greater than the mean can be classified as being low acculturated. On this basis, 93 and 82 respondents were classified into low-acculturation-group and high-acculturation-group, respectively. Although the sample sizes are desirable, it is problematic to classify those whose acculturation scores are around the mean into either the low acculturation group or high acculturation group, which makes the two groups less distinctive than they were.

Alternatively, the third approach based on percentiles was tried (G.J. Walker, personal communication, May 15, 2003), where Chinese respondents were classified into three groups. Those whose acculturation scores that are less than 3.63 (33 percentiles) were categorized into high acculturation group, and those whose acculturation scores that are greater than 3.92 (66 percentiles) were categorized into low acculturation group, while the remainder were categorized into middle acculturation group. As a result, 63, 55, and 57 Chinese respondents were classified into three groups with high, middle and low acculturation, respectively. For hypothesis analysis involving acculturation, only the two groups--Chinese with high acculturation and Chinese with low acculturation--will be included.

A further examination of the relationship of acculturation to sex, age, income, education, and length of residence indicated that age ($p < .001$), education ($p < .05$) and length of residence ($p < .001$) were significantly related to acculturation while sex was not and income was marginally related ($p = .09$) (Table 4-9). This finding indicated that the younger tend to be easily acculturated than the older, and those who with a higher level of education, income or a longer length of residence are more likely to be acculturated than those who with a lower level of education, income ora shorter length of residence.

Table 4-9

Regression Analysis of Acculturation on Sex, Age, Education, Income, and Length of Residence

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	*SE*	Beta	*t*	Sig
Sex	0.05	0.06	.06	0.77	.443
Age	0.09	0.03	.22	2.94**	.004
Education	-0.10	0.04	-.21	-2.45*	.016
Income	-0.05	0.03	-.14	-1.71	.090
Length of residence	-0.02	0.00	-.37	-4.50**	.000

Note. 1. Acculturation is negatively related to scores. That is, higher scores means low acculturation while lower scores refers to higher acculturation. Therefore, a variable with a positive coefficient (e.g., age) implies it is negatively related to acculturation while a variable with a negative coefficient means it is positively related to acculturation (i.e., education).

2. As length of residence, generation, and ethnicity identity were positively significantly related to each other, length of residence, which has the strongest relationship with acculturation, was chosen for regression analysis so that multicollinearity can be avoided.

3. $^*p < .05$, $^{**}p < .001$.

National Parks

This sub-section presents the findings on respondents' attitudes of the two groups toward national park policy, roles and functions, and appropriate uses. Descriptive statistics, factor analysis, MANCOVAs and ANCOVAs are presented under each of the three dimensions of attitudes toward national parks. Six hypotheses are tested in this sub-section.

National Park Policy

Descriptive Statistics

Of the ten statements in the survey that focused on national park policy, four had the greatest frequency of response in either the "mildly agree" or "strongly agree" category for both groups (Table 4-10). These items are items 1 and 7 that refer to the limitation of visitor numbers and uses, items 9 and 10 involving maintaining ecological integrity and phasing out inappropriate uses of national parks. In addition, item 2 that relates to Parks Canada's lenience in allowing environmentally harmful recreational activities had the greatest percentage in category "agree" for Anglo-Canadians. Additionally, item 1 that applies to the limitation of visitor numbers had the highest frequency in the "strongly agree" category for Anglo-Canadians (59.7%) and Chinese (45.1%) with the mean being 4.45 out of 5 for Anglo-Canadians and 4.19 for Chinese, respectively.

Four items had the greatest frequency of response in the category "strongly disagree" for Anglo-Canadians and one item for Chinese. These items are: item 4 on Parks Canada's concern over the protection of the natural environment and wildlife (51.3% for Anglo-Canadians), item 5 on Parks Canada's compromise on the protection of park environment and provision of recreational experience (44.7% for Anglo-Canadians), item 6 on Parks Canada's consideration of outdoor recreation needs and preferences of park visitors (35.9% for Anglo-Canadians), and item 8 on threats from provision of recreational or commercial activities to the integrity of national parks (54.8% for Anglo-Canadians and 35.2% for Chinese). Item 8 "Neither the provision of a wide variety of visitor activities nor commercial activity threatens the natural environment and wildlife of the national parks" had the highest frequency of response in "strongly disagree" category and the lowest mean value for both groups (1.73 for Anglo-Canadians and 2.09 for Chinese). Additionally, each group had one item which had the highest frequency of response in the "disagree" category, namely item 3 on restricting public enjoyment and use of parks for Anglo-Canadians (36.5%), and item 5 on Parks Canada's compromise on the protection of park environment and provision of recreational experience for Chinese (38.8%).

From the preliminary analysis, it is clear that both groups thought that Parks Canada was pursuing the correct policy in protecting the park environment while providing for the visitors' experience. In relative terms, Anglo-Canadians are more likely to support Parks Canada's policy of making the protection of ecological integrity of Canada's national parks its first priority. In addition, Chinese respondents tended to be more conservative by not going to extremes and instead choosing the middle range of responses.

Table 4-10

Percent, Means and Standard Deviations for Policy of National Parks

	Percent of respondents					Descriptive statistics	
Items	SD	MD	N	MA	SA	*M*	*SD*
1. Parks Canada should limit the numbers of visitors if the natural environment and wildlife of the parks are threatened	0.6	3.1	6.3	30.2	59.7	4.45	0.80
	2.3	5.1	9.1	38.3	45.1	4.19	0.96
2. Parks Canada is too lenient in allowing recreation activities that harm the environment	5.7	14.6	27.2	36.1	16.5	3.43	0.10
	6.3	12.6	52.0	20.6	8.6	3.13	0.96
3. Parks Canada is tending to unnecessarily restrict public enjoyment and use of parks in order to promote greater preservation of the park environment	25.6	36.5	26.3	10.3	0. 3	2.25	0.99
	8.5	25.4	53.7	10.7	1.7	2.72	0.83
4. Parks Canada is becoming too concerned with protecting the natural environment and wildlife.	51.3	28.5	11.4	7. 6	1.3	1.79	1.00
	9.0	20.3	54.2	13.0	3.4	2.82	0.89

(*Table continues*)

Table 4-10. (*continued*)

	Percent of respondents					Descriptive statistics	
Items	SD	MD	N	MA	SA	*M*	*SD*
5. Parks Canada should be willing to compromise on protecting the park environment in order for visitors to experience as wide range of outdoor recreation activities as possible within national parks	44.7	25.2	10.1	16.4	3.8	2.09	1.24
	12.9	38.8	28.1	16.3	3.9	2.60	1.03
6. Parks Canada does not pay sufficient attention to the outdoor recreation needs and preferences of park visitors	35.9	31.4	22.4	9.6	0.6	2.08	1.01
	7.3	31.1	51.4	7.9	2.3	2.67	0.82
7. Parks Canada should limit recreational/tourism activities, facilities, and services if the scenic beauty of the parks is threatened.	5.1	5.1	8.2	33.5	48.1	4.15	1.10
	1.1	6.2	17.4	42.7	32.6	3.99	0.92
8. Neither the provision of a wide variety of visitor activities nor commercial activity threatens the natural environment and wildlife of the national parks.	54.8	26.8	12.7	1.9	3.8	1.73	1.02
	35.2	34.7	19.9	6.8	3.4	2.09	1.06

(*Table continues*)

Table 4-10. (*continued*)

Items	Percent of respondents					Descriptive statistics	
	SD	MD	N	MA	SA	*M*	*SD*
9. Parks Canada should use protecting the natural environment and wildlife as the primary criterion for all resource and visitor management decisions within national parks	1.9	6.3	9.4	34.0	48.4	4.21	0.98
	2.3	3.4	18.1	43.5	32.8	4.01	0.92
10. Parks Canada should phase out inappropriate recreational uses within national parks	3.2	8.2	18.4	25.3	44.9	4.01	1.12
	2.3	2.8	15.3	44.3	35.2	4.07	0.91

Note. 1. Participants were instructed: "Listed below are statements about national park policy. Please use the following scale to indicate how much you agree or disagree with it by circling your response." Items are measured using a 5-point scale (1 = strongly disagree (SD), 2 = mildly disagree (MD), 3 = neutral (N), 4 = mildly agree (MA), 5 = strongly agree (SA)). 2. Values in shaded boxes refer to Chinese respondents.

Factor Analysis

Table 4-11 shows the results of factor analysis of the 10-item attitude measure on national park policy. Two factors emerged with each factor consisting of four items (items 1, 7, 9, 10 for factor one, and items 3, 4, 5, 6 for factor two). Items 2 and 8 did not load on either of the two factors, as the loading value for each of them is less than 0.45. These two factors can be labeled respectively as priority on ecological integrity and compromise between use and protection (see Table 4-12).

Table 4-11

Principal Components Analysis (Using Varimax Rotation) of National Park Policy Items

Category	Factor 1	Factor 2
Eigenvalue	3.39	1.41
Percent of variance	33.9	14.1
Cumulative percent	33.9	48.0
Items		
1. Parks Canada should limit the numbers of visitors if the ecological integrity of the parks is threatened	**.67**	-.17
2. Parks Canada is too lenient in allowing recreation activities that harm the environment	**.42**	-.28
3. Parks Canada is tending to unnecessarily restrict public enjoyment and use of parks in order to promote greater preservation of the park environment	.14	**.81**
4. Parks Canada is becoming too concerned with protecting ecological integrity.	-.12	**.73**
5. Parks Canada should be willing to compromise on protecting the park environment in order for visitors to experience as wide range of outdoor recreation activities as possible within national parks	-.38	**.64**

(*Table continues*)

Table 4-11. (*continued*)

Items	Factor 1	Factor 2
6. Parks Canada does not pay sufficient attention to the outdoor recreation needs and preferences of park visitors	-.37	**.64**
7. Parks Canada should limit recreational/tourism activities, facilities, and services if the ecological integrity of the parks is threatened.	**.76**	.05
8. Neither the provision of a wide variety of visitor activities nor commercial activity threatens the integrity of the national parks.	-.34	.41
9. Parks Canada should use ecological integrity as the primary criterion for all resource and visitor management decisions within national parks	**.73**	-.15
10. Parks Canada should phase out inappropriate and non-conforming recreational uses within national parks	**.53**	-.19

Note: 1. Loadings of 0.45 and above are in bold. 2. Difference of 0.10 was used to separate the primary and secondary loadings.

Table 4-12 lists the two factors and their corresponding loading items, and the standardized Cronbach alpha for each scale for both ethnic groups. The table shows that both factors have satisfactory reliability values. For factor one, the standardized Cronbach alpha is .65 for Anglo-Canadians and .72 for Chinese, respectively. For factor two, the standardized Cronbach alpha is .81 for Anglo-Canadians and .64 for Chinese, respectively.

Table 4-12

National Park Policy Factor Loadings and Scale Cronbach's Coefficient Alphas

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables		Comments
		Anglo-Canadians	Chinese	
Factor 1: Priority on ecological integrity (33.9%)		.65	.72	Item deletion not necessary
1. Parks Canada should limit the numbers of visitors if the ecological integrity of the parks is threatened	.67			
7. Parks Canada should limit recreational/tourism activities, facilities, and services if the ecological integrity of the parks is threatened.	.76			
9. Parks Canada should use ecological integrity as the primary criterion for all resource and visitor management decisions within national parks	.73			
10. Parks Canada should phase out inappropriate and non-conforming recreational uses within national parks	.53			

(*Table continues*)

Table 4-12. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables: Anglo-Canadians	*a* for standardized variables: Chinese	Comments
Factor 2: compromise between use and protection (14.1%)		.81	.64	Item deletion not necessary
3. Parks Canada is tending to unnecessarily restrict public enjoyment and use of parks in order to promote greater preservation of the park environment	.81			
4. Parks Canada is becoming too concerned with protecting ecological integrity.	.73			
5. Parks Canada should be willing to compromise on protecting the park environment in order for visitors to experience as wide range of outdoor recreation activities as possible within national parks	.64			
6. Parks Canada does not pay sufficient attention to the outdoor recreation needs and preferences of park visitors	.64			

Hypothesis Test: Ethnicity

In order to test H1: There exist significant differences in attitudes toward the revised policy of national parks between Chinese in Canada and Anglo-Canadians, a MANCOVA was first performed on the two factors. Following the MANCOVA, subsequent ANCOVAs were then performed.

As Table 4-13 illustrates, on the first scale the Anglo-Canadian group's mean of 4.22 was greater than the Chinese group's mean of 4.07. This indicates that the former place a higher priority on ecological integrity. Additionally, the table indicates that the Anglo-Canadian group had a lower mean score (*M* = 2.04, *SD* = 0.83) on the compromise between use and protection scale than the Chinese group (*M* = 2.70, *SD* = 0.63). Since these scale items were reverse worded, the lower score means that Anglo-Canadians endorsed Parks Canada's policy of balancing use and protection with emphasis on the latter than did the Chinese.

Table 4-13

Descriptive Statistics for the Two Sub-Scales of National Park Policy

Scale	Anglo-Canadians		Chinese	
	M	*SD*	*M*	*SD*
Priority on ecological integrity	4.22	0.69	4.07	0.68
Compromise between use and protection	2.04	0.83	2.70	0.63

In order to statistically test the differences between the two groups, a MANCOVA with two group factors (i.e., ethnicity, Anglo-Canadians, *n* = 141, Chinese, *n* = 155 and sex, female, *N* = 132, male, *N* = 164) and three covariates (i.e., age, education, and income) was performed on the two dependent variables (i.e., the two sub-scales). The

Box's M test indicates that the homogeneity of variance-covariance was not met, *F* (9, 801087) = 3.25, $p < .001$. The departures from homogeneity of variance-covariance are only minor or inconsequential taking into account the small *F* value (Rodgers, 2003). In term of homogeneity of regression slopes, as Table 4-14 illustrates, the interactions between each of the three covariates were not significant. Therefore, the assumption of homogeneity of regression slopes was met for all the three covariates, and the use of MANCOVA deemed feasible. In addition, neither of the interactions between income and education, income and age, and education and age was significant (Table 4-15), suggesting the three variables--age, education, and income--can be considered as covariates. The results of the MANCOVA are presented in Table 4-16.

Table 4-14

Tests of Homogeneity of Regressions for National Park Policy

Source	Wilks' Λ	*F*	*df*	*p*
Ethnicity * Income	.933	1.661	8, 376	.106
Ethnicity * Education	.964	1.742	4, 376	.140
Ethnicity * Age	.947	1.034	10, 376	.414
Sex * Income	.955	1.025	8, 352	.416
Sex * Education	.982	.812	4, 352	.518
Sex * Age	.961	.707	10, 352	.718

Note. Interactions were tested separately on ethnicity and sex.

Table 4-15

Test of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for National Park Policy

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.93	0.85	24, 560	.667
Income * Age	0.89	0.88	36, 544	.676
Education * Age	0.88	1.40	28, 588	.087

Note. Interactions were tested separately on each pair.

Table 4-16

Multivariate Analysis of Covariance for National Park Policy

Source	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	0.98	2.67	2, 288	.071	.02	.53
Education	0.99	1.60	2, 288	.205	.01	.34
Age	1.00	.53	2, 288	.592	.00	.14
Ethnicity (E)	0.79	37.31**	2, 288	.000	.21	1.00
Sex (S)	0.99	1.28	2, 288	.282	.01	.28
E * S	0.97	4.63*	2, 288	.010	.03	.78

Note. $*p = .01$, $**p < .001$.

As noted in Table 4-16, after holding the demographic characteristics constant and considering the interaction between sex and ethnicity, Anglo-Canadians and Chinese did differ overall in regard to their attitudes toward national park policy, Wilks' Λ = .79, *F* (2, 288) = 37.31, $p < .001$. 21% of the variance in the two scales was explained by the ethnicity ($\eta_p^2 = .21$). According to Weinfurt (1995), the partial eta square of .21 for the main effect of ethnicity indicates a medium to large effect size (.09 and .25, respectively). In addition, the probability of rejecting the null hypothesis when it is false is 1.00 (β = 1.00). The main effects of income, education, age, and sex were not significant. However, there was significant interaction between ethnicity and sex, Wilks' $\Lambda = .97$, $F(2, 288) = 4.63$, $p = .01$.

Separate ANCOVAs were then performed on the two national park policy sub-scales. For the first sub-scale, priority on ecological protection, ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 145$, Chinese, $n = 156$, and sex, females, $N = 134$, males, $N = 167$) and three covariates (i.e., age, education, and income) was computed. The results of this analysis are presented in Table 4-17. Levene's test of equality of error variances indicates that the error variance of the dependent variable is equal across groups, $F(3, 297) = 0.40$, $p > .05$.

Table 4-17

Analysis of Covariance for National Park Policy-Priority on Ecological Integrity

Source	*MS*	*F*	*df*	*p*	η_p^2	β
Income	1.84	3.99*	1, 294	.047	.01	.51
Education	0.65	1.40	1, 294	.237	.00	.22
Age	0.11	0.25	1, 294	.620	.00	.08
Ethnicity (E)	2.77	6.01**	1, 294	.015	.02	.69
Sex (S)	0.73	1.59	1, 294	.208	.01	.24
E * S	1.15	2.49	1, 294	.116	.01	.35

Note. Mean squares were calculated based on the Type III sum of squares; *$p < .05$, **$p < .025$ (i.e., $p = .05/2$, where 2 refers to the number of sub-scales).

Table 4-17 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity tested by Bonferroni approach is significant, $F\ (1, 294) = 6.01$, $p < .025$. This suggests that there is a significant difference between the two groups in attitudes toward placing priority on ecological integrity by Parks Canada, with Anglo-Canadians ($M = 4.22$, $SD = 0.69$) being more supportive of Parks Canada's policy than were Chinese ($M = 4.07$, $SD = 0.68$). Additionally, it should be noted that the main effect of income was significant ($p < .05$) for this scale, albeit not at the Bonferroni level. On the other hand, neither of the other main effects nor the interaction effect between ethnicity and sex was significant ($p > .05$).

For the second sub-scale, compromise between use and protection, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 143$, Chinese, $n = 159$, and sex, females, $N = 133$, males, $N = 169$) and the three covariates was computed. The results of this analysis are presented in Table 4-18. Levene's test of equality of error variances across groups was not met, $F\ (3, 298) = 12.25$, $p < .001$.

Table 4-18

Analysis of Covariance for National Park Policy-Compromise between Use and Protection

Source	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.06	0.11	1, 295	.740	.00	.06
Education	1.39	2.66	1, 295	.104	.01	.37
Age	0.99	1.89	1, 295	.170	.01	.28
Ethnicity (E)	36.79	70.20*	1, 295	.000	.19	1.00
Sex (S)	0.06	0.01	1, 295	.918	.00	.05
E * S	4.34	8.29*	1, 295	.004	.03	.82

Note. Mean squares were calculated based on the Type III sum of squares; $^*p < .025$ (i.e., $p = .05/2$, where 2 refers to number of sub-scales).

Table 4-18 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity tested by Bonferroni approach is significant, *F* (1, 295) = 70.20, $p < .025$. This suggests there is a significant difference between the two groups in attitudes toward the compromise between use and protection of national park resources, with Anglo-Canadians (*M* = 2.04, *SD* = .83) being less likely than Chinese (*M* = 2.70, *SD* = 0.63) to perceive that Parks Canada was too concerned over the protection of ecological integrity. None of the other main effects was significant ($p > .05$). It should be noted that the interaction between ethnicity and sex was significant at the adjustment Bonferroni level, *F* (1, 295) = 8.29, $p < .025$. A further examination of the interaction means (Table 4-19) by Tukey's Honestly Significant Difference (HSD) procedure (cf. Lee, 1999) suggested that there is no effect ($p > .05$) within either the Anglo-Canadian group or the Chinese group, while there is an effect ($p < .01$) between the two groups, namely Anglo-Canadian females (*M* = 1.92, *SD* = 0.77) are more likely than Chinese females (*M* = 2.91, *SD* = 0.58) and males (*M* = 2.62, *SD* = 0.59) to think that Parks Canada were pursuing the correct policy on the protection of park resources, and so are Anglo-Canadian males (*M* = 2.17, *SD* = 0.93).

Table 4-19

Mean Differences for All Possible Paired Comparisons (diff(i - j) = $\textit{row}_i$ *-* $\textit{column}_j$*))- Compromise between Use and Protection*

Ethnicity			Anglo-Canadians		Chinese	
	Sex		Females	Males	Females	Males
		Mean	1.92	2.17	2.91	2.62
Anglo-Canadians	Females	1.92		-0.25	-0.99*	-0.70*
	Males	2.17			-0.74*	-0.45*
Chinese	Females	2.91				0.29
	Males	2.62				

Note. Different at $p < .01$ using Tukey's HSD procedure.

Based on the above, **H1: There exist significant differences in attitudes toward the revised policy of national parks between Chinese in Canada and Anglo-Canadians** was supported by the MANCOVA and subsequent ANCOVAs. That is, in comparison with Anglo-Canadians, Chinese were less supportive of Parks Canada's policy on limiting visitor numbers, restricting and phasing out inappropriate uses while more likely to support the provision of more recreational activities and facilities.

Hypothesis Test: Acculturation

In order to test H2: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the revised policy of Canadian national parks, a MANCOVA was first performed on the two sub-scales. Following the MANCOVA, pair comparison tests were then performed.

As Table 4-20 illustrates, for the first sub-scale, ecological integrity, the Anglo-Canadian group had the greater mean (*M* = 4.21, *SD* = 0.68) than the Chinese group with low acculturation (*M* = 4.11, *SD* = 0.61), which had greater mean that the Chinese group with high acculturation (*M* = 3.99, *SD* = 0.74). This indicates that acculturation did not have an effect as hypothesized on this scale. As for the second sub-scale, compromise between use and protection, the Anglo-Canadian group had the lowest mean score (*M* = 2.03, *SD* = 0.84) and the Chinese group with low acculturation had the highest (*M* = 2.87, *SD* = 0.56), while the Chinese group with high acculturation fell in-between (*M* = 2.60, *SD* = 0.62). This indicates that that the more acculturated the Chinese were, the more similar their attitudes were to those held by Anglo-Canadians.

Table 4-20

Descriptive Statistics for the Two Sub-Scales of National Park Policy-Acculturation

			Chinese			
	Anglo-Canadians		High Acculturation		Low acculturation	
Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*
Priority on ecological integrity	4.21	0.68	4.01	0.76	4.17	0.62
Compromise between use and protection	2.03	0.84	2.53	0.71	2.92	0.53

In order to statistically test the differences between the three groups, a MANCOVA with two group factors (i.e., acculturation, Anglo-Canadians, *n* = 141, Chinese with high acculturation, *n* = 52, and Chinese with low acculturation, *n* = 49; and sex, female, *N* = 108, male, *N* = 134) and three covariates (i.e., age, education, and income) was performed on the two dependent variables (i.e., the two scales). The Box's M test indicates that the homogeneity of variance-covariance was not met, *F* (15, 66180) = 1.92, *p* = .017, and the departures from homogeneity of variance-covariance are only minor or inconsequential taking into account the small *F* value (Rodgers, 2003). However, the assumption of homogeneity of regression coefficients was met for all the three covariates (Table 4-21), thus indicating that the use of MANCOVA was feasible. Additionally, there were no significant interaction effects between each two of the three independent variables (i.e., age, education, and income) (Table 4-22). This indicates that that the inclusion of the three variables as covariates was appropriate. The results of the MANCOVA are presented in Table 4-23.

Table 4-21

Tests of Homogeneity of Regression Coefficients for National Park Policy-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*
Acculturation * Income	0.93	0.61	16, 250	.873
Acculturation * Education	0.94	1.01	8, 250	.431
Acculturation * Age	0.85	1.15	18, 250	.304
Sex * Income	0.96	0.74	8, 258	.653
Sex * Education	0.98	0.66	4, 258	.620
Sex * Age	0.97	0.45	10, 258	.923

Note. Interactions were separately tested on acculturation and sex.

Table 4-22

Test of Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for National Park Policy-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.92	0.82	24, 452	.717
Income * Age	0.87	0.86	36, 436	.697
Education * Age	0.87	1.25	28, 472	.182

Note. Interactions were tested separately on each pair.

Table 4-23

Multivariate Analysis of Covariance for National Park Policy-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	0.98	2.35	2, 232	.097	.02	.47
Education	0.99	1.50	2, 232	.226	.01	.32
Age	0.99	0.64	2, 232	.531	.01	.16
Acculturation (A)	0.77	15.97*	4, 464	.000	.12	1.00
Sex (S)	0.99	0.98	2, 232	.378	.01	.22
A * S	0.97	1.69	4, 464	.152	.01	.52

Note. $^*p < .001$.

After holding the demographic characteristics constant and considering the interaction between acculturation and sex, the three groups did differ overall in regard to their attitudes toward national park policy, Wilks' $\Lambda = 0.77$, $F(4, 464) = 15.97$, $p < .001$ (Table 4-23). It was estimated that 12% of the variance in the two dependent variables can be attributed to group membership ($\eta_p^2 = .12$), and the probability of correctly rejecting the null hypothesis when it is false is 1.00 ($\beta = 1.00$). The main effects of income, education, age, and sex were not significant and neither was the interaction effect between acculturation and sex.

Table 4-23 indicates that significant differences existed in attitudes toward national park policy among the three groups. The significant simple main effect of group membership was further analyzed by pairwise comparisons using the Bonferroni adjustment for multiple comparisons. Table 4-24 presents the results of this analysis for estimated marginal means. The pairwise comparisons are presented in Table 4-25.

Table 4-24

Estimated Marginal Means for National Park Policy

Dependent Variable	Groups	*M*	*SE*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Scale 1	Anglo-Canadians	4.26	0.06	4.14	4.38
	High acculturation	3.95	0.10	3.74	4.15
	Low acculturation	4.11	0.10	3.91	4.31
Scale 2	Anglo-Canadians	1.97	0.07	1.84	2.10
	High acculturation	2.66	0.11	2.44	2.89
	Low acculturation	2.96	0.11	2.74	3.18

Note. Means evaluated at covariates appeared in the model: Income = 2.78, Education = 2.86, Age = 2.94.

As illustrated in Table 4-25, for the first sub-scale, priority on ecological integrity, the high acculturated (*M* = 3.95, *SE* = 0.10) Chinese are significantly different from Anglo-Canadians (*M* = 4.26, *SE* = 0.06), while the low acculturated Chinese (*M* = 4.11, *SE* = 0.10) are not. In addition, there was no significant difference between the Chinese with high acculturation and the Chinese with low acculturation. For the second sub-scale, compromise between use and protection, Anglo-Canadians (*M* = 1.97, *SE* = 0.07) were significantly different from the Chinese with high acculturation (*M* = 2.6, *SE* = 0.11), and from the Chinese with low acculturation (*M* = 2.96, *SE* = 0.11) while the two Chinese groups were not significantly different from one another.

Table 4-25

Pairwise Comparisons for National Park Policy

Dependent variables	Groups I	Groups J	Mean difference (I – J)	*SE*	*p*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Scale 1	High acculturation	Low acculturation	-0.16	0.14	.764	-0.50	0.18
		Anglo-Canadians	-0.31*	0.13	.038	-0.62	-0.01
	Low acculturation	Anglo-Canadians	-0.15	0.12	.622	-0.45	0.14
Scale 2	High acculturation	Low acculturation	-0.30	0.16	.166	-0.67	0.08
		Anglo-Canadians	0.69**	0.14	.000	0.36	1.02
	Low acculturation	Anglo-Canadians	0.99**	0.13	.000	0.67	1.31

Note. The multiple comparisons based on estimated marginal means with adjustment Bonferroni; **p* < .05, ***p* < .001.

Based on the above analysis, **H2: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the revised policy of Canadian national parks** was not supported by the pairwise comparison tests. That is, for the first sub-scale, the Chinese group with high acculturation was significantly different from the Anglo-Canadian group, which was not significantly different from the Chinese with low acculturation as had been anticipated. For the second sub-scale, the two Chinese sub-groups were both significantly different from the Anglo-Canadian group. Interestingly, there was no significant difference between the two Chinese sup-groups with respect to the two sub-scales.

Within Group Issues

In order to examine the relationships between two policy scales, a zero-order Pearson correlation analysis was separately conducted among Anglo-Canadians and the Chinese. The results are reported in Table 4-26 and Table 4-27. In addition, separate regression analyses were conducted to examine the relationships of these two sub-scales to socio-demographic variables.

Table 4-26

Zero-Order Pearson Correlation Coefficients between Two Policy Sub-Scales for Anglo-Canadians (Maximum N =154)

	Priority on ecological integrity	Compromise between use and protection
Priority on ecological integrity	_	
Compromise between use and protection	-.53* (.000)	_

Note. Values in parentheses refer to *p* values; * $p < .001$.

Table 4-27

Zero-Order Pearson Correlation Coefficients between Two Policy Sub-Scales for Chinese (Maximum N = 174)

	Priority on ecological integrity	Compromise between use and protection
Priority on ecological integrity	_	
Compromise between use and protection	-.20* (.000)	_

Note. Values in parentheses refer to *p* values; * $p < .001$.

Anglo-Canadians. For Anglo-Canadians, the first sub-scale, priority on ecological integrity, was negatively significantly related to the second sub-scale, compromise between use and protection ($p < .001$). This suggested that those who supported placing first priority on ecological integrity did not support compromise of protection by use.

Separate regression analyses of the two scales on sex, education, income, and numbers of visits to national parks indicated that these variables were not significantly related to either of the two variables. This suggested that Anglo-Canadians' attitudes toward national park policy were homogenous regardless of the differences in socio-demographic characteristics and frequencies of visits to national parks.

Chinese. Compared with Anglo-Canadians, the two sub-scales with regard to the Chinese were also negatively significantly related with each other. This indicated that the endorsement of placing first priority on ecological integrity is consistent with disagreement on compromise of protection by use.

One more variable, acculturation, was included in the separate regression analyses with respect to the Chinese. The results indicated that none of the five variables was significantly related to the first sub-scale. However, sex ($p < .001$), income ($p < .05$), and acculturation ($p < .05$) were found to be significantly related to the second sub-scale. This indicated that female Chinese or those with a lower level of income were less likely than their male counterparts or those with a higher level of income to consider that Parks Canada's were pursuing correct policy on balancing protection with use. In addition, less acculturated Chinese were less likely than more acculturated Chinese to hold this attitude.

National Park Roles and Functions

Descriptive Statistics

Respondents' attitudes toward the roles and functions of national parks are shown in Table 4-28. Of the 20 items briefly relating to the roles and functions of national parks, over 80% of Anglo-Canadians either mildly or strongly agreed with 9 items (i.e., items 1, 2, 3, 7, 9, 14, 15, 18, and 19). Similarly, over 80% of Chinese either mildly or strongly agreed with nine items (i.e., items 1, 2, 3, 6, 7, 8, 9, 18, and 19), although three of these items are different from Anglo-Canadians. The mean for each of these items was greater than 4.0 for both groups. Of these items, five items with respect to the protection of natural resources and wildlife, endangered species, and scenic beauty (items 1, 7, and 19), protection of the biological integrity (item 9), and protection of enjoyment for future generations (item 14) had the greatest frequency of response of over 75.0% in the category of "strongly agree" for Anglo-Canadians. Four of these five items (items 1, 7, 9, and 19) and item 2 involving learning about nature had the greatest frequency of response of over 60.0% in the category of "strongly agree" for the Chinese group. Item 1 "national parks are places for protecting natural resources and wildlife" had the highest mean of 4.87 out of 5 for Anglo-Canadians and 4.66 for Chinese respondents.

The most negative responses (combining "mildly disagree" and "strongly disagree") toward the roles and functions of national parks involve commercial use and development (item 10), with 92.4% for Anglo-Canadians and 93.2% for Chinese; future use (item 12), with 74.9% for Anglo-Canadians and 37.0% for Chinese; global warming reduction (item 16), with 28.4% for Chinese; social interactions (item 20), with 26.8% for Anglo-Canadians and 35.4% for Chinese. Item 10 "National parks are places for commercial development of natural resources (such as: oil, gas, timber, minerals)" had the lowest mean of 1.28 out of 5 for Anglo-Canadians and 1.38 for Chinese among all 20 items. This result clearly indicates that both groups do not consider commercial development in national parks as being compatible with the protection role of national parks.

Based on the above descriptive analysis, it is obvious that both groups place a high priority on the protection of the biological integrity of Canada's national parks, and that they consider the protection of natural resources, wildlife and their habitats as the fundamental role of national parks. In comparison, human activities associated with national parks were considered less important.

Despite the similarities demonstrated by the two groups, there exist distinct differences in of some of the items' frequencies. First, Chinese respondents were less likely than Anglo-Canadians to choose the extremes of "strongly disagree" or "strongly agree" while instead being more likely to choose "neutral". For instance, for Anglo-Canadians, the average frequency of the aforementioned five highest frequencies of "strongly agree" is 82.2% with the highest being 89.3% (item 1). For the Chinese group, the average frequency for the five highest frequencies of responses in the same category is 63.9% with highest being 69.7% (item 1). There were five items that had the highest frequency of responses in the category "neutral" for Chinese while there were two in the case of Anglo-Canadians. Second, visible observation of mean differences suggests that the two groups differ considerably with regards to a number of items (i.e., items 8, 11, 12, 14, etc.). These differences will be analyzed statistically in a later part of this section.

Table 4-28

Percent, Means and Standard Deviations for Roles and Functions of National Parks

Items	Percent of respondents					Descriptive statistics	
	SD	MD	N	MA	SA	*M*	*SD*
1. National parks are places for protecting the natural environment and wildlife	0.0 0.0	0.0 0.0	1.9 3.9	8.8 26.4	89.3 69.7	4.87 4.66	0.39 0.55
2. National parks are places for learning about nature	0.6 0.0	0.6 0.0	5.1 3.9	35.4 30.3	58.2 65.7	4.50 4.62	0.68 0.56
3. National parks are places for people's enjoyment	0.6 0.6	3.8 2.2	8.9 9.6	34.4 36.0	52.2 51.7	4.34 4.36	0.84 0.79
4. National parks are places for scientific research and monitoring	0.7 1.1	4.6 4.5	16.3 24.3	44.4 32.2	34.0 37.9	4.07 4.01	0.86 0.95
5. National parks are places for recreational activities	1.9 2.8	10.1 12.9	15.7 26.4	45.3 29.2	27.0 28.7	3.86 3.68	0.99 1.11
6. National parks are places for protecting cultural and historical heritage	3.2 2.2	5.7 5.1	15.8 10.7	25.9 30.3	49.4 51.7	4.13 4.24	1.08 0.99

(*Table continues*)

Table 4-28. (*continued*)

Items	Percent of respondents					Descriptive statistics	
	SD	MD	N	MA	SA	*M*	*SD*
7. National parks are areas to protect endangered species of flora, fauna, and wildlife habitats	0.6 0.0	0.0 5.1	1.9 6.7	14.5 28.1	83.0 60.1	4 .79 4.43	0.53 0.83
8. National parks are tourist destinations	1.9 0.6	11.5 1.1	13.5 15.3	41.0 39.5	32.1 43.5	3.90 4.24	1.04 0.79
9. Protecting the natural environment and wildlife should be the first priority of national parks	0.6 0.0	1.9 3.4	1.9 9.6	15.8 27.0	79.7 60.1	4.72 4.44	0.66 0.80
10. National parks are places for commercial development of natural resources (such as: oil, gas, timber, minerals)	81.1 71.9	11.3 21.3	5.7 5.1	1.9 0.6	0.0 1.1	1.28 1.38	0.66 0.71
11. National parks help to promote a sense of Canadian identity	1.9 2.2	1.3 6.2	18.2 32.6	35.2 36.0	43.4 23.0	4.17 3.71	0.90 0.96
12. National parks are reserves of natural resources for future use	51.6 14.0	23.3 23.0	12.6 25.3	6.9 22.5	5.7 15.2	1.92 3.02	1.20 1.28
13. National parks provide economic benefits	3.2 4.5	10.8 15.2	34.2 35.4	37.3 28.1	14.6 16.9	3.49 3.38	0.98 1.07

(*Table continues*)

Table 4-28. (*continued*)

	Percent of respondents					Descriptive statistics	
Items	SD	MD	N	MA	SA	*M*	*SD*
14. National parks are places to be protected for the enjoyment of future generations	1.3	1.9	3.8	10.1	83.0	4.72	0.74
	3.4	15.3	23.2	31.6	26.6	3.63	1.13
15. National parks are places for all living things to exist	1.9	5.0	11.3	23.3	58.5	4.31	1.00
	2.8	11.2	23.6	34.8	27.5	3.73	1.07
16. National parks help to reduce global warming	2.6	3.9	42.6	24.5	26.5	3.68	0.99
	11.4	17.0	37.5	18.8	15.3	3.10	1.19
17. National parks function as places for spiritual fulfillment	4.4	5.1	25.9	33.5	31.0	3.82	1.07
	2.8	8.5	34.7	31.8	22.2	3.62	1.01
18. National parks function to preserve biological diversity	0.0	1.3	16.6	35.0	47.1	4.28	0.78
	0.0	3.4	11.9	40.1	44.6	4.26	0.80
19. National parks are places to protect scenic beauty of nature	0.0	0.6	1.3	21.4	76.7	4.74	0.51
	0.0	0.6	5.6	29.8	64.0	4.57	0.63
20. National parks function as place for socializing	8.3	18.5	30.6	28.7	14.0	3.22	1.15
	14.6	20.8	32.0	24.2	8.4	2.91	1.17

Note. 1. Participants were instructed: "Listed below are statements about roles and functions of national parks. For each one, please use the following scale to indicate how much you agree or disagree with each statement by circling your response." Items are measured using a 5-point scale (1 = strongly disagree (SD), 2 = mildly disagree (MD), 3 = neutral (N), 4 = mildly agree (MD), 5 = strongly agree (SD). 2. Values in the shaded boxes refer to Chinese respondents.

Factor Analysis

Five factors initially emerged with eigenvalues greater than one. However, five items did not load on any of the five factors. Moreover, the results are not easily interpretable, and consequently a four-factor solution was tried and subsequently adopted. Table 4-29 shows the factor loadings and corresponding reliabilities of these four factors. The four factors explained, cumulatively, 49.5% of the variance. As indicated in Table 4-30, each of the four factors emphasizes a specific dimension of national park roles and functions. Factor one emphasizes the fundamental role of national parks as places for the protection of ecological integrity. Factor two reveals the important functions of national parks as places for the protection of existence values or non-market values such as protection of biological diversity and scenic beauty, symbolic/spiritual fulfillment, and reduction of global warming. Factor three reflects the important role of national parks as places for provision of leisure opportunities. Factor four reflects people's perceptions of the instrumental values of national parks such as commercial development and the future use of natural resources. Item 16 is included on factor two with a loading of .44, sufficiently close to .45, while item 13 is excluded because of its low loading of .42.

Reference was made in previous section to the fact that a number of items regarding national park roles and functions in this study are adopted from Borrie and colleagues' study (Borrie et al., 2001) on Yellowstone National Park. When the present study's factor results are compared with their factor results, factors one, two, and three are found to be nearly identical, thus endorsing the validity of this measure as well as the choice of four factors instead of five.

Table 4-29

Principal Components Analysis (Using Varimax Rotation) of National Park Roles and Functions

Category	Factor 1	Factor 2	Factor 3	Factor 4
Eigenvalue	4.58	2.50	1.46	1.34
Percent of variance	22.9	12.5	7.3	6.7
Cumulative percent	22.8	35.4	42.8	49.5
Items				
1. National parks are places for protecting the natural environment and wildlife	**.76**	.00	-.02	-.06
2. National parks are places for learning about nature	**.65**	.11	.33	-.01
3. National parks are places for people' s enjoyment	.27	.10	**.76**	-.05
4. National parks are places for scientific research and monitoring	**.56**	.12	.26	.21
5. National parks are places for recreational activities	.00	.12	**.75**	.17
6. National parks are places for protecting cultural and historical heritage	**.49**	.32	.17	.30
7. National parks are areas to protect endangered species of flora, fauna, and wildlife habitats	**.71**	.24	-.07	-.06
8. National parks are tourist destinations	.03	.11	**.80**	.00
9. Protecting the natural environment and wildlife should be the first priority of national parks	**.66**	.12	-.20	-.04

(*Table continues*)

Table 4-29. (*continued*)

Items	Factor 1	2	3	4
10. National parks are places for commercial development of natural resources (such as: oil, gas, timber, minerals)	-.08	-.08	.12	**.75**
11. National parks help to promote a sense of Canadian identity	.24	**.58**	.11	.04
12. National parks are reserves of natural resources for future use	.08	.15	.06	**.72**
13. National parks provide economic benefits	-.15	**.42**	.23	.21
14. National parks are places to be protected for the enjoyment of future generations	-.03	**.50**	.19	.02
15. National parks are places for all living things to exist	.19	**.53**	-.01	.23
16. National parks help to reduce global warming	.28	**.44**	-.15	.31
17. National parks function as places for spiritual enjoyment of people	.09	**.67**	.19	.01
18. National parks function to preserve biological diversity	.38	**.60**	-.06	-.19
19. National parks are places to protect scenic beauty of nature	.24	**.54**	.25	-.22
20. National parks are as places for socializing	-.22	.32	**.57**	.17

Note: 1. Loadings of 0.45 and above are in bold. 2. Difference of 0.10 was used to separate the primary and secondary loadings.

Table 4-30 lists the four factors and their corresponding loading items, and the standardized Cronbach alpha of each scale for both groups. The table shows that all scales except for factor four have satisfactory reliability values, ranging from .65 to .81 for Anglo-Canadians and .71 to .81 for Chinese (without item deletion). The standardized Cronbach alpha for factor four is .47, and the item correlation between the two items is .30. Therefore, factor 4 will be excluded from further analysis because of its low reliability.

Table 4-30

National Park Roles and Functions Factor Loadings and Scale Cronbach's Coefficient Alphas

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables: Anglo-Canadians	*a* for standardized variables: Chinese	Comments
Factor 1: Ecological integrity (22.9%)		.65	.81	Item deletion not necessary
1. National parks are places for protecting the natural environment and wildlife	.76			
2. National parks are places for learning about nature	.65			
4. National parks are places for scientific research and monitoring	.56			
6. National parks are places for protecting cultural and historical heritage	.49			

(*Table continues*)

Table 4-30. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables		Comments
		Anglo-Canadians	Chinese	
7. National parks are areas to protect endangered species of flora, fauna, and wildlife habitats	.71			
9. Protecting the natural environment and wildlife should be the first priority of national parks	.66			
Factor 2: Non-market values (12.5%)		.66	.75	Item deletion not necessary
11. National parks help to promote a sense of Canadian identity	.58			
14. National parks are places to be protected for the enjoyment of future generations	.50			
15. National parks are places for all living things to exist	.53			
16. National parks help to reduce global warming	.44			
17. National parks function as places for spiritual enjoyment of people	.67			

(*Table continues*)

Table 4-30. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables Anglo-Canadians	 Chinese	Comments
18. National parks function to preserve biological diversity	.60			
19. National parks are places to protect scenic beauty of nature	.54			
Factor 3: Leisure opportunities (7.3%)		.81	.71	Item deletion not necessary
3. National parks are places for people' s enjoyment	.76			
5. National parks are places for recreational activities	.75			
8. National parks are tourist destinations	.80			
20. National parks are as places for socializing	.57			
Factor 4: Instrumental values (6.9%)		.47	.47	Excluded from further analysis
10. National parks are places for commercial development of natural resources (such as: oil, gas, timber, minerals)	.75			
12. National parks are reserves of natural resources for future use	.72			

Hypothesis Test: Ethnicity

In order to test H3: There exist significant differences in attitudes toward the roles and functions of national parks between Chinese in Canada and Anglo-Canadians, a MANCOVA was first performed on the three scales. Following the MANCOVA, separate ANCOVA on each of the three scales was then performed.

The means and standard deviations for the two groups with respect to the three sub-scales of national park roles and functions were presented in Table 4-31. As illustrated in the table, Anglo-Canadians had greater mean scores for all three sub-scales than Chinese. While the mean scores for scale 1, ecological integrity, and particularly for scale 3, leisure opportunities, are close for both groups, there is a considerable difference in mean score for scale 2 between the two groups, with 4.25 for the Anglo-Canadians and 3.80 for Chinese.

Table 4-31

Descriptive Statistics for the Three Sub-Scales of National Park Roles and Functions

Scale	Anglo-Canadians		Chinese	
	M	*SD*	*M*	*SD*
Ecological integrity	4.51	0.43	4.40	0.56
Non-market values	4.25	0.49	3.80	0.62
Leisure opportunities	3.82	0.81	3.80	0.71

In order to statistically test the differences in the three scales between the two groups, a MANCOVA with two grouping factor (i.e., ethnicity, Anglo-Canadians, n = 128, Chinese, n = 154, and sex, females, N = 122, males, N = 160) and the three covariates (i.e., age, education, and income) was performed on the three scales. Box's M test indicates that the assumption of homogeneity of variance-covariance was not met, F (18, 226651) = 1.70, p = .03. However, the F value is small, and thus the influence of the violation of the assumption is inconsequential (Rodgers, 2003). However, the assumption of homogeneity of regression coefficients was met for all the three covariates as none of the interaction effects was significant (Table 4-32). This indicates the use of MANCOVA was feasible. Additionally, there were no significant interaction effects between each two of the three independent variables (i.e., age, education, and income) (Table 4-33). This indicates that the inclusion of the three variables as covariates was appropriate. The results of the MANCOVA are presented in Table 4-34.

Table 4-32

Tests of Homogeneity of Regression for National Roles and Functions

Effect	Wilks' Λ	*F*	*df*	*p*
Ethnicity * Income	0.95	0.77	12, 471	.681
Ethnicity * Education	0.98	0.71	6, 356	.641
Ethnicity * Age	0.94	0.81	15, 492	.666
Sex * Income	0.94	0.83	12, 434	.625
Sex * Education	0.95	1.44	6, 328	.199
Sex * Age	0.95	0.57	15, 453	.899

Note. Interactions were tested separately on ethnicity and sex.

Table 4-33

Test of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for National Park Roles and Functions

Effect	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.90	0.81	36, 784	.780
Income * Age	0.89	0.58	54, 764	.993
Education * Age	0.89	0.82	42, 820	.784

Note. Interactions were tested separately on each pair.

Table 4-34

Multivariate Analysis of Covariance for National Park Roles and Functions

Effect	Wilks' Λ	F	df	p	η_p^2	β
Income	0.99	0.69	3, 273	.556	.01	.20
Education	1.00	0.39	3, 273	.762	.00	.13
Age	0.97	2.48	3, 273	.061	.03	.61
Ethnicity	0.90	9.95*	3, 273	.000	.10	1.00
Sex	0.98	2.21	3, 273	.088	.02	.56
Ethnicity * Sex	1.00	0.07	3, 273	.976	.00	.06

Note. *$p < .001$.

After holding the demographic characteristics constant and considering the interaction between sex and ethnicity, Anglo-Canadians and Chinese did differ overall in regard to their attitudes toward national park roles and functions, Wilks' Λ = .90, F (3, 273), $p < .001$ (Table 4-34). The partial eta square of .10 indicates that the main effect of ethnicity accounted for 10% of the total variability in the three dependent variables (i.e., the three sub-scales). In addition, the probability of correctly rejecting the false hypothesis is 1.00 ($\beta = 1.00$). The main effects of age, education, income, and sex were not significant, and nor was the interaction between ethnicity and sex ($p > .05$).

Separate ANCOVAs were then performed on the three sub-scales. For scale 1, ecological integrity, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 139$, Chinese, $n = 159$, and sex, females, $N = 133$, males, $N = 165$) and three covariates (i.e., age, education, and income) was computed. The results of this analysis are presented in Table 4-35. Levene's test of equality of error variances across groups was not met for this factor, F (3, 294) = 5.63, $p = .001$.

Table 4-35

Analysis of Covariance for National Park Roles and Functions-Ecological Integrity

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.24	0.91	1, 291	.342	.00	.16
Education	0.16	0.59	1, 291	.442	.00	.12
Age	0.08	0.32	1, 291	.574	.00	.09
Ethnicity (E)	0.68	2.60	1, 291	.108	.01	.36
Sex (S)	0.68	2.58	1, 291	.109	.01	.36
E * S	0.03	0.12	1, 291	.725	.00	.06

Note. Mean squares were calculated based on the Type III sum of squares.

Table 4-35 indicates that after holding age, education, and income constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was not significant, *F* (1, 291) = 2.60, *p* > .05, suggesting that there was no significant difference between the two groups in their attitudes toward the role of national park as places for the protection of ecological integrity. The main effects of age, education, income and sex are not significant, nor is the interaction between ethnicity and sex (*p* > .05).

For scale 2, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, *n* = 142, Chinese, *n* = 156, and sex, females, *N* = 131, males, *N* = 167) and the three covariates was computed. Levene's test of equality of error variances across groups was met for this scale, *F* (3, 294) = 2.56, *p* > .05. The results of this analysis are presented in Table 4-36.

Table 4-36

Analysis of Covariance for National Park Roles and Functions-Non-Market Values

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.90	2.89	1, 291	.090	.01	.40
Education	0.15	0.48	1, 291	.487	.00	.11
Age	0.74	2.38	1, 291	.124	.01	.34
Ethnicity (E)	7.73	24.88**	1, 291	.000	.08	1.00
Sex (S)	1.21	3.89*	1, 291	.050	.01	.50
E * S	0.00	0.01	1, 291	.943	.00	.05

Note. Mean squares were calculated based on the Type III sum of squares; $*p = .05$, $**p < .017$ (i.e., $p = .05/3$, where 3 refers to the number of sub-scales).

Table 4-36 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 291) = 24.88$, $p < .017$. This suggests that there did exist significant difference between the two groups in attitudes toward the non-market values of national park as places for promoting Canadian identity, fulfilling spirituality, reducing global warming, and that Anglo-Canadians ($M = 4.25$, $SD = 0.49$) were more cognitive of the non-market values of national parks than were Chinese ($M = 3.80$, $SD = 0.62$). It should be noted that the main effect of sex was significant ($p = .05$), albeit not at the Bonferroni level. This indicates that females ($M = 4.09$, $SD = 0.61$) placed more emphasis on the non-market values of national park than males ($M = 3.96$, $SD = 0.59$). Neither of the other main effects nor the interaction effect between ethnicity and sex was significant ($p > .05$).

For scale 3, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, *n* = 139, Chinese, *n* = 159, and sex, females, *N* = 130, males, *N* = 168) and the three covariates was computed, and the results are presented in Table 4-37. Levene's test of equality of error variances across groups was met for this scale, *F* (3, 294) = 0.50, *p* > .05.

Table 4-37

Analysis of Covariance for National Park Roles and Functions-Leisure Opportunities

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	1.06	1.94	1, 291	.164	.01	.28
Education	0.00	0.00	1, 291	.979	.00	.05
Age	0.08	0.15	1, 291	.695	.00	.07
Ethnicity (E)	0.00	0.01	1, 291	.938	.00	.05
Sex (S)	1.43	2.63	1, 291	.106	.01	.37
E * S	0.03	0.05	1, 291	.829	.00	.06

Note. Mean squares were calculated based on the Type III sum of squares.

Table 4-37 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was not significant, *F* (1, 291) = 0.01, *p* > .05, suggesting there were no significant differences between the two groups in attitudes toward the role of national park as places for leisure provision. The main effects of income, education, age, and sex are not significant, nor is the interaction between ethnicity and sex.

Based on the above, H3: **There exist significant differences in attitudes toward the roles and functions of national parks between Chinese in Canada and Anglo-**

Canadians was supported by the MANCOVA. However, further examinations of the follow-up ANCOVAs indicated that both groups did not differ in attitudes toward ecological integrity and leisure opportunities, but did differ in attitudes toward non-market values.

Hypothesis Test: Acculturation

In order to test H4: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the roles and functions of Canadian national parks, a MANCOVA was first performed on the three scales. Following the MANCOVA, pair comparison tests were then undertaken.

The means and standard deviations for the three scales regarding national park roles and functions are presented in Table 4-38. From the table, it is apparent that acculturation does not work as anticipated for the three scales, particularly for scale 1, ecological integrity, and scale 3, leisure opportunities. For instance, for scale 1, the Chinese with low acculturation had the same mean of 4.51 with Anglo-Canadians while the Chinese with high acculturation had a mean of 4.27, which is less than that of the other two groups. In the case of scale 3, the mean of 3.87 for the Chinese with low acculturation is close to the mean of 3.81 for Anglo-Canadians while the mean of 3.67 for the Chinese with high acculturation fell in between the two. For scale 2, leisure opportunities, the mean of 3.85 for the Chinese with high acculturation is closer to the mean of 3.81 for the Chinese with low acculturation than to the mean of 4.26 for Anglo-Canadians. This is the fact despite that the mean for the Chinese with high acculturation is slightly greater than that of the Chinese with low acculturation.

Table 4-38

Descriptive Statistics for the Three Sub-Scales of National Park Roles and Functions-Acculturation

Scale	Anglo-Canadians		Chinese High Acculturation		Chinese Low acculturation	
	M	*SD*	*M*	*SD*	*M*	*SD*
Ecological integrity	4.51	0.42	4.27	0.61	4.51	0.50
Non-market values	4.26	0.49	3.85	0.65	3.81	0.57
Leisure opportunities	3.81	0.78	3.67	0.69	3.87	0.72

In order to statistically test the differences in the three sub-scales among the three groups, a MANCOVA with two group factors (i.e., acculturation, Anglo-Canadians, n = 128, Chinese with high acculturation, n = 52, and Chinese with low acculturation, n = 49; and sex, female, N = 100, male, N = 129) and three covariates (i.e., age, education, and income) was performed on the three dependent variables (i.e., the three sub-scales). The Box's M test indicates that the homogeneity of variance-covariance was met, F (30, 37255) = 1.10, $p > .05$. In addition, the assumption of homogeneity of regression coefficients was met for all the three covariates as none of the interaction effects was significant (Table 4-39). This indicates the use of MANCOVA was feasible. Moreover, as shown in Table 4-40, there were no significant interaction effects between each two of the three independent variables (i.e., age, education, and income). This indicates that that the inclusion of the three variables as covariates was appropriate. The results of the MANCOVA are presented in Table 4-41.

Table 4-39

Tests of Homogeneity of Regression for Roles and Functions-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*
Acculturation * Income	0.82	0.99	24, 337	.482
Acculturation * Education	0.95	0.48	12, 307	.926
Acculturation * Age	0.83	0.84	27, 339	.700
Sex * Income	0.91	0.96	12, 307	.492
Sex * Education	0.91	1.97	6, 232	.071
Sex * Age	0.86	1.21	15, 321	.259

Note. Interactions were tested separately on acculturation and sex.

Table 4-40

Tests of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for National Park Roles and Functions-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.88	0.76	36, 627	.845
Income * Age	0.85	0.63	54, 606	.982
Education * Age	0.84	0.96	42, 653	.555

Note. Interactions were tested separately on each pair.

Table 4-41

Multivariate Analysis of Covariance for National Park Roles and Functions-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	0.99	0.39	3, 218	.761	.01	.13
Education	0.99	0.93	3, 218	.429	.01	.25
Age	0.95	3.75*	3, 218	.012	.05	.81
Acculturation (A)	0.87	5.30**	6, 436	.000	.07	1.00
Sex (S)	0.98	1.45	3, 218	.230	.02	.38
A * S	0.99	0.29	6, 436	.939	.00	.13

Note. $*p < .05$, $**p < .001$.

After holding the demographic characteristics constant and considering the interaction between acculturation and sex, the three groups did differ overall in regard to their attitudes toward national park roles and functions, Wilks' Λ = 0.87, *F* (6, 436) = 5.30, $p < .001$ (Table 4-41). It was estimated that 7.0% of the variance in the three dependent variables can be attributed to group membership ($\eta_p^2 = .70$), and the probability of rejecting the null hypothesis when it is false is 1.00 ($\beta = 1.00$). It should be noted that the main effects of age were significant, Wilks' Λ = 0.95, *F* (3, 218) = 3.75, $p < .05$. However, neither of the main effects with regards to income, education, and sex nor the interaction effect between group membership and sex was significant ($p > .05$).

Table 4-41 also shows that there did exist significant differences in attitudes toward national park roles and functions among the three groups. The significant simple main effect of group membership was further analyzed by pairwise comparisons using the Bonferroni adjustment for multiple comparisons. Table 4-42 presents the results of this analysis for estimated marginal means. The pairwise comparisons are presented in Table 4-43.

Table 4-42

Estimated Marginal Means for National Park Roles and Functions

Dependent Variable	Groups	*M*	*SE*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Scale 1	Anglo-Canadians	4.50	0.05	4.41	4.59
	High acculturation	4.29	0.07	4.15	4.44
	Low acculturation	4.51	0.07	4.36	4.65
Scale 2	Anglo-Canadians	4.24	0.05	4.13	4.34
	High acculturation	3.91	0.08	3.74	4.07
	Low acculturation	3.85	0.08	3.69	4.02
Scale 3	Anglo-Canadians	3.81	0.07	3.67	3.95
	High acculturation	3.69	0.11	3.46	3.91
	Low acculturation	3.90	0.11	3.68	4.12

Note. Means evaluated at covariates appeared in the model: Income = 2.79, Education = 2.89, Age = 2.83.

The data in Table 4-43 shows that, for scale 1 and scale 3, there were no significant differences among the three groups at the adjustment Bonferroni level, while for scale 2, Anglo-Canadians (*M* = 4.24, *SE* = 0.05) were significantly different from the Chinese with high acculturation (*M* = 3.91 *SE* = 0.08) and from the Chinese with low acculturation (*M* = 3.85, *SE* = 0.08). There were no significant differences in the three scales between the two Chinese sub-groups. It should be noted that for scale 1 the Chinese with high acculturation were significantly different from Anglo-Canadians at the unadjusted Bonferroni level ($p < .05$) (i.e., .063/3 = .021).

Table 4-43

Pairwise Comparisons for National Park Roles and Functions

Dependent variables	Groups		Mean difference (I – J)	*SE*	*p*	95% Confidence Interval	
	I	J				Lower Bound	Upper Bound
Scale 1	High acculturation	Low acculturation	-0.22	0.10	.101	-0.46	0.03
		Anglo-Canadians	-0.21	0.09	.063	-0.43	0.01
	Low acculturation	Anglo-Canadians	0.01	0.09	1.000	-0.21	0.22
Scale 2	High acculturation	Low acculturation	0.05	0.11	1.000	-0.22	0.33
		Anglo-Canadians	-0.33*	0.10	.005	-0.57	-0.08
	Low acculturation	Anglo-Canadians	-0.38*	0.10	.001	-0.63	-0.14
Scale 3	High acculturation	Low acculturation	-0.22	0.16	.504	-0.59	0.16
		Anglo-Canadians	-0.13	0.14	1.000	-0.46	0.21
	Low acculturation	Anglo-Canadians	0.09	0.14	1.000	-0.25	0.42

Note. The multiple comparisons based on estimated marginal means with adjustment Bonferroni; *$p < .001$.

Based on the above, **H4: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the roles and functions of Canadian national parks** was not supported by the follow-up pair comparisons. That is, acculturation did not act as hypothesized for all three scales. Simply put, there were no significant differences between the two Chinese sub-groups with different acculturation levels, nor were there significant differences among the three sub-groups for scale 1 and scale 2 while Anglo-Canadians were significantly different from the two Chinese sub-groups for scale 3, regardless of their acculturation level.

Within Group Issues

The relationships among the three national park role and function sub-scales for the two groups are presented in Table 4-44 and Table 4-45. In addition, separate regression analyses were also conducted for the two groups to examine the relationships of the three scales to socio-demographic variables.

Table 4-44

Zero-Order Pearson Correlation Coefficients among National Park Role and Function Sub-Scales for Anglo-Canadians (Maximum N = 151)

	Ecological integrity	Non-market values	Leisure opportunities
Ecological integrity	_		
Non-market values	.49*	_	
	(.000)		
Leisure opportunities	.24*	.39*	_
	(.004)	(.000)	

Note. Values in parentheses refer to *p* values; **p* < .001.

Table 4-45

Zero-Order Pearson Correlation Coefficients among National Park Role and Function Sub-Scales for Chinese (Maximum N = 174)

	Ecological integrity	Non-market values	Leisure opportunities
Ecological integrity	_		
Non-market values	.55*	_	
	(.000)		
Leisure opportunities	.23*	.27*	_
	(.003)	(.000)	

Note. Values in parentheses refer to *p* values; $*p < .001$.

Anglo-Canadians. Table 4-44 indicats that the three scales are significantly related to one another. The positive signs of the coefficients suggested that people who endorsed ecological integrity as the primary role of national parks also emphasized the non-market values of national parks and the importance of national pakrs as places for the provision of leisure opportunities for the public.

Separate regression analyses of each of three scales on sex, age, education, income, and visit times to national parks suggested that attitudes held by Anglo-Canadians toward national park roles and functions were relatively homogenous. For instance, all five variables were not significantly related to non-market values and leisure opportunities and sex was the single variable that was significantly related to ecological integrity. Female Anglo-Canadians were more supportive of ecological integrity than were their male counterparts.

Chinese. As Table 4-45 illustrates, the three scales were also positively significantly related to one another as compared with Anglo-Canadians. This suggested that while attitudes held by the Chinese toward ecological integrity and non-market values were compatible with attitudes toward leisure opportunities.

A further examination of the relationships of each of three scales to sex, age, education, income, frequencies to national parks, and acculturation by regression analyses indicated that Chinese respondents' attitudes toward the three dimensions of national park roles and functions were highly homogenous, in that all six variables were not significantly related to any of three scales ($p > .05$).

Appropriate Uses

Descriptive Statistics

Table 4-46 lists the frequency of responses, the mean and standard deviation for each appropriate use item. Of the 28 items, only eight were considered highly appropriate by both ethnic groups, with five of these eight items being the same. These items are: item 1 "tents/campground" (45.6% for Anglo-Canadians), item 12 "visitor information/interpretive centers" (62.3% for Anglo-Canadians and 47.2% for Chinese), item 15 "rock-climbing/mountaineering" (48.4% for Anglo-Canadians), "Hiking/backpacking" (66.9% for Anglo-Canadians and 46.6% for Chinese), item 20 "Jogging/running/walking" (60.8% for Anglo-Canadians and 54.5% for Chinese), item 21 "wildlife watching" (79.9% for Anglo-Canadians and 62.7% for Chinese), item 23 "boating/canoeing/kayaking" (55.3% for Anglo-Canadians), and item 26 "taking pictures" (82.4% for Anglo-Canadians and 67.8% for Chinese). The three highest appropriate uses were "taking pictures" (82.4%), "wildlife watching" (79.9%), and "hiking/backpacking" (66.9%) for the Anglo group, and "taking pictures" (67.8%), "wildlife watching"(62.7%), and "jogging/running/walking" (54.5%) for the Chinese group. The item "taking pictures" had the highest mean of 4.81 out of 5 for Anglo-Canadians (vs. 4.64 for Chinese).

Out of the 28 uses listed, seven had the greatest frequency of responses in the category "highly inappropriate" for either the Anglo-Canadian or the Chinese group. Both groups shared three out of these seven items. These items are: item 3 "permanent residency/private homes" (42.7% for Anglo-Canadians), item 5 "sports fields" (29.2% for Chinese), item 6 "golf courses" (27.7% for Anglo-Canadians and 25.6% for Chinese), item 18 "power boating" (51.3% for Anglo-Canadians), item 22 "gambling/casinos" (93.0% for Anglo-Canadians and 76.8% for Chinese), item 25 "hunting" (92.5% for Anglo-Canadians and 53.4% for Chinese), and item 27 "gathering natural edible products (fruit, berries, mushrooms, fern fiddleheads, etc)" (34.2% for Anglo-Canadians). The top most inappropriate uses from the perspective of Anglo-Canadians are "gambling/casinos", "hunting", and "power boating", while for Chinese, they are "gambling/casinos", "hunting", and "Residency/permanent homes". Park activity "gambling/casinos" had the lowest mean value of 1.09 out of 5 for Anglo-Canadians (vs. 1.38 for Chinese).

As noted, both groups shared similar attitudes toward some of the 28 items. For instance, both considered taking pictures and watching wildlife as the most appropriate activities while gambling and hunting were the two most inappropriate activities within Canada's national parks. However, for each of those items with the greatest frequency of responses in either the "highly appropriate" or the "highly inappropriate" category, there was a distinct gap between the two groups in a given frequency, with Chinese respondents being more likely to choose the middle ones and less likely to choose the extremes. This finding is similar to what was found in terms of attitudes toward the roles and functions of national parks. In addition, based on a preliminary visual observation, there exist differences in mean scores on a majority of the 28 items between the two groups (i.e., items 3, 4, 11, 13, 15, 18, 19, etc.). These differences will be analyzed statistically in a later part of this section.

Table 4-46

Percent, Means and Standard Deviations for Appropriate Uses of National Parks

Items	Percent of respondents					Descriptive statistics	
	HI	MI	N	MA	HA	*M*	*SD*
1. Tents/campgrounds	1.3	3.8	9.4	40.0	45.6	4.25	0.87
	4.5	3.4	11.2	48.9	32.0	4.01	0.99
2. Hotel/motel accommodation	10.6	18.1	13.8	45.6	11.9	3.30	1.21
	12.4	17.5	26.0	31.6	12.4	3.14	1.21
3. Residency/ permanent homes	23.8	28.1	22.5	20.0	5.6	2.56	1.21
	42.7	28.7	20.2	6.7	1.7	1.96	1.03
4. Children's playgrounds	5.1	22.3	22.9	31.8	17.8	3.35	1.16
	21.5	13.6	23.7	30.5	10.7	2.95	1.32
5. Sports fields	21.3	30.0	26.9	13.8	8.1	2.58	1.20
	29.2	26.4	21.3	14.6	8.4	2.47	1.28
6. Golf courses	27.7	21.4	25.8	19.5	5.7	2.54	1.24
	25.6	21.0	23.9	19.9	9.7	2.67	1.31

(*Table continues*)

Table 4-46. (*continued*)

Items	Percent of respondents					Descriptive statistics	
	HI	MI	N	MA	HA	*M*	*SD*
7. Skiing areas	9.4	13.1	26.9	37.5	13.1	3.32	1.15
	7.9	9.6	21.9	41.6	19.1	3.54	1.14
8. Grocery stores and laundromats	9.5	25.3	23.4	34.2	7.6	3.05	1.13
	18.6	20.3	28.8	26.6	5.6	2.80	1.19
9. Restaurants or lounges	12.6	21.4	23.3	36.5	6.3	3.03	1.16
	6.7	11.2	19.7	41.6	20.8	3.58	1.14
10. Gas/service stations	7.0	17.7	22.8	39.9	12.7	3.34	1.12
	10.7	11.8	21.3	37.6	18.5	3.42	1.22
11. Gift shops	8.8	18.2	33.3	31.4	8.2	3.12	1.08
	3.9	8.4	25.3	42.7	19.7	3.66	1.01
12. Visitor information/	0.6	1.9	3.8	31.4	62.3	4.53	1.72
interpretive centres	0.0	1.1	14.6	37.1	47.2	4.30	0.76
13. School/educational services	7.5	11.3	25.2	37.1	18.9	3.48	1.15
	20.2	30.3	30.3	12.9	6.2	2.54	1.14
14. Hospital/medical services	1.9	10.1	24.1	37.3	26.6	3.77	1.02
	7.9	10.7	39.0	28.8	13.6	3.29	1.08
15. Rock-climbing/	0.0	3.8	11.3	36.5	48.4	4.30	0.82
mountaineering	2.2	3.4	22.5	38.2	33.7	3.98	0.95

(*Table continues*)

Table 4-46. (*continued*)

	Percent of respondents					Descriptive statistics	
Items	HI	MI	N	MA	HA	*M*	*SD*
16. Sightseeing by car	1.3	7.0	14.0	48.4	29.3	3.97	0.91
	4.5	9.0	16.9	44.4	25.3	3.77	1.07
17. Hiking/backpacking	0.6	0.6	5.1	26.8	66.9	4.59	0.68
	0.0	1.1	10.7	41.6	46.6	4.34	0.71
18. Power boating	51.3	27.2	14.6	4.4	2.5	1.80	1.01
	13.6	18.1	32.2	24.3	11.9	3.03	1.20
19. Mountain biking	7.5	14.5	14.5	35.2	28.3	3.62	1.25
	2.3	6.2	13.6	43.5	34.5	4.02	0.97
20. Jogging/running/walking	0.0	0.6	7.6	31.0	60.8	4.52	0.67
	0.6	1.1	2.2	41.6	54.5	4.48	0.66
21. Wildlife watching	0.0	0.0	3.1	17.0	79.9	4.77	0.49
	0.0	0.6	5.6	31.1	62.7	4.56	0.63
22. Gambling/Casinos	93.0	5.1	1.9	0.0	0.0	1.09	0.35
	76.8	10.2	11.3	1.7	0.0	1.38	0.75
23. Non-motorized boating/canoeing/kayaking	1.3	1.9	5.7	35.8	55.3	4.42	0.79
	1.7	5.1	14.7	42.9	35.6	4.06	0.93
24. Picnicking/Barbecuing	0.6	6.3	16.5	41.8	34.8	4.04	0.91
	6.8	11.4	17.6	37.5	26.7	3.66	1.18

(*Table continues*)

Table 4-46. (*continued*)

Items	Percent of respondents					Descriptive statistics	
	HI	MI	N	MA	HA	*M*	*SD*
25. Hunting	92.5	4.4	0.6	2.5	0.0	1.13	0.53
	53.4	12.9	23.0	7.3	3.4	1.94	1.17
26. Taking pictures	0.0	0.0	1.3	16.4	82.4	4.81	0.42
	0.0	0.0	2.8	29.4	67.8	4.65	0.53
27. Gathering natural edible	34.2	23.4	15.8	19.6	7.0	2.42	1.32
products (fruit, berries, mushrooms, fern fiddleheads, etc)	19.1	18.0	25.3	27.0	10.7	2.92	1.28
28. Fishing	15.1	22.6	25.2	25.8	11.3	2.96	1.24
	9.6	11.2	25.8	34.3	19.1	3.42	1.20

Note. 1. Participants were instructed: "Listed below are selected activities, facilities, and services that are provided in Canadian national parks. Please use the following scale to indicate how environmentally appropriate or inappropriate each is by circling your response." Items are measured using a 5-point scale (1 = highly inappropriate (HI), 2 = moderately inappropriate (MI), 3 = neutral (N), 4 = moderately appropriate (MA), 5 = highly appropriate (HA)). 2. Values in the shaded boxes refer to Chinese respondent.

Factor Analysis

Seven factors emerged from the factor analysis of the 28 items measuring respondents' attitudes toward appropriate uses of national parks (Table 4-47). These seven factors explained, cumulatively, 62.5% of the variance. Factor one includes seven items (i.e., items 2, 3, 8, 9, 10, 13, and 14) and reflects respondents' attitudes toward the appropriateness of accommodation/service facilities (Table 4-48). Factor two has nine items (i.e., items 1, 15, 17, 19, 20, 21, 23, 24, and 26) and exhibits respondents' attitudes toward non-consumptive activities, which are generally passive or appreciative. Factor three has three items (i.e., items 4, 5, and 6) and reflects respondents' attitudes toward the appropriateness of sports and recreation facilities within Canada's national parks. Item 7 ("skiing areas") under this category is not included in factor three because of its low loading and cross loading with other factors. Factors four and five each have two items and can be labeled motorized activities and consumptive activities, respectively. Factor six includes two facility items, namely item 11 "gift shops" and item 12 "visitor information/interpretive centres". This factor can be labeled visitor facilities. Finally, factor seven consisted of only one item and has been excluded from further analysis.

Interestingly, item 22 ("gambling/casinos") and item 25 ("hunting"), the two most inappropriate activities according to both ethnic groups, did not load with any of the other items, suggesting that these two activities are isolated from the other activities.

Table 4-47

Principal Components Analysis (Using Varimax Rotation) of National Park Appropriate Uses

Category	Factor 1	2	3	4	5	6	7
Eigenvalue	7.43	3.03	2.13	1.46	1.26	1.10	1.06
Percent of variance	26.5	11.0	7.6	5.2	4.5	3.9	3.8
Cumulative percent	26.5	37.5	45.1	50.3	54.8	58.7	62.5
Items							
1. Tents/campgrounds	.41	**.53**	.01	-.08	-.06	-.11	.32
2. Hotel/motel accommodation	**.68**	.05	.25	.17	.03	.20	.01
3. Residency/ permanent homes	**.69**	.01	.16	.06	.27	-.18	.03
4. Children's playgrounds	.20	.09	**.84**	.06	-.12	-.01	.16
5. Sports fields	.26	.08	**.83**	.18	.05	.04	.09
6. Golf courses	.25	-.08	**.65**	.26	.35	.16	-.09
7. Skiing areas	.40	.15	.41	.34	.35	.09	-.21
8. Grocery stores and laundromats	**.74**	.14	.23	-.01	-.06	.13	.13
9. Restaurants or lounges	**.70**	.09	.17	.27	-.11	.32	.09
10. Gas/service stations	**.73**	.09	.02	.21	-.10	.33	.15
11. Gift shops	.39	.05	.17	.25	.09	**.54**	-.02
12. Visitor information/ interpretive centres	.28	.30	.03	-.01	-.02	**.62**	-.14
13. School/educational services	**.53**	.22	.30	-.23	.14	-.20	-.21
14. Hospital/medical services	**.71**	.24	.05	.01	-.06	.06	-.11

(*Table continues*)

Table 4-47. (*continued*)

Category	Factor						
	1	2	3	4	5	6	7
15. Rock-climbing/ mountaineering	.26	**.66**	-.01	.13	.19	-.16	-.06
16. Sightseeing by car	.24	.19	.06	**.60**	.07	.27	-.07
17. Hiking/backpacking	.14	**.79**	-.01	.00	.24	.05	-.02
18. Power boating	.01	.16	.28	**.72**	.04	.04	.15
19. Mountain biking	.03	**.59**	.18	.49	.08	-.20	-.08
20. Jogging/running/walking	.09	**.72**	.16	.10	.05	.12	-.02
21. Wildlife watching	.01	**.64**	-.01	-.03	.00	.32	-.15
22. Gambling/Casinos	.26	-.17	.03	.42	.10	-.17	.42
23. Non-motorized boating/ canoeing/kayaking	.13	**.73**	.03	.08	-.06	.00	.05
24. Picnicking/Barbecuing	.18	.51	.35	-.02	.02	.22	.36
25. Hunting	-.02	-.04	.12	.05	.30	-.07	**.76**
26. Taking pictures	-.09	**.63**	-.02	.11	.01	.34	-.02
27. Gathering natural edible products (fruit, berries, mushrooms, fern fiddleheads, etc)	.00	.12	-.02	.12	**.72**	-.15	.11
28. Fishing	-.06	.15	.13	-.04	**.71**	.28	.27

Note: 1. Loadings of 0.45 and above are in bold. 2. Difference of 0.10 was used to separate the primary and secondary loadings.

Table 4-48 lists the six usable factors and their corresponding loading items, and the standardized Cronbach alpha for each scale for both ethnic groups. The table shows that the first three factors have satisfactory reliability values ranging from .82 to .89 for Anglo-Canadians and .81 to .84 for Chinese, while all three other factors have poor reliability. In view of each of these three factors consisting of only two items, a further inter-item correlation was examined. The results indicate that for factor four, the correlation between the two items is .26 for Anglo-Canadians. However, this value is as high as .42 for the Chinese group. Therefore, this factor will be retained for further analysis. For factor five, the correlation between the two items is .37 for Anglo-Canadians and .35 for Chinese. For factor six, the correlation between the two items is .39 for Anglo-Canadians and .42 for Chinese. As the inter-item correlations for the both groups in terms of the latter two factors are higher, factors five and six will be retained for further analysis.

Table 4-48

National Park Appropriate Use Factor Loadings and Scale Cronbach's Coefficient Alphas

		a for standardized variables		
Factor (Proportion): Scale name & items	Loadings	Anglo-Canadians	Chinese	Comments
Factor 1: Accommodation and service facilities (26.5%)		.89	.82	Item deletion not necessary
2. Hotel/motel accommodation	.68			
3. Residency/ permanent homes	.69			

(*Table continues*)

Table 4-48. (*continued*)

		a for standardized variables		
Factor (Proportion): Scale name & items	Loadings	Anglo-Canadians	Chinese	Comments
8. Grocery stores and laundromats	.74			
9. Restaurants or lounges	.70			
10. Gas/service stations	.73			
13. School/educational services	.53			
14. Hospital/medical services	.71			
Factor 2: Non-consumptive activities (11.0%)		.86	.84	Item deletion not necessary
1. Tents/campgrounds	.53			
15. Rock-climbing/ mountaineering	.66			
17. Hiking/backpacking	.79			
19. Mountain biking	.59			
20. Jogging/running/walking	.72			
21. Wildlife watching	.64			
23. Non-motorized boating/canoeing/kayaking	.73			
24. Picnicking/Barbecuing	.51			
26. Taking pictures	.63			

(*Table continues*)

Table 4-48. (*continued*)

		a for standardized variables		
Factor (Proportion): Scale name & items	Loadings	Anglo-Canadians	Chinese	Comments
Factor 3: Sport/recreation facilities (7.6%)		.82	.81	Item deletion not necessary
4. Children's playgrounds	.84			
5. Sports fields	.83			
6. Golf courses	.65			
Factor 4: Motorized activities (5.2%)		.41	.59	Item deletion not necessary
16. Sightseeing by car	.60			
18. Power boating	.72			
Factor 5: Consumptive activities (4.5%)		.54	.51	Item deletion not necessary
27. Gathering natural edible products (fruit, berries, mushrooms, fern fiddleheads, etc)	.72			
28. Fishing	.71			
Factor 6: Visitor facilities (3.9%)		.56	.59	Item deletion not necessary
11. Gift shops	.54			
12. Visitor information/ interpretive centres	.62			

Hypothesis Test: Ethnicity

In order to test H5: There exist significant differences in attitudes toward appropriate use of national parks between Chinese in Canada and Anglo-Canadians, a MANCOVA was first performed on the six scales. Following the MANCOVA, separate ANCOVA was then performed on each of the six sub-scales.

Table 4-49 shows the means and standard deviations of the six sub-scales for national park appropriate uses. Anglo-Canadians had higher mean scores for the first three sub-scales (i.e., scale 1, accommodation and service facilities; scale 2, non-consumptive activities; and scale 3, sport/recreation facilities) and lower mean scores for the remainders (i.e., scale 4, motorized activities; scale 5, consumptive activities, and scale 6, visitor facilities) than did Chinese. This indicates that Anglo-Canadians are more likely than Chinese to perceive accommodation and service facilities, non-consumptive activities, and sport/recreation facilities as appropriate while less likely than Chinese to consider motorized activities, consumptive activities, and visitor facilities to be appropriate. Both groups had the highest means on scale 2 with 4.37 for the former and 4.20 for the latter.

Table 4-49

Descriptive Statistics for the Six Sub-Scales of National Park Appropriate Uses

Scale	Anglo-Canadians		Chinese	
	M	*SD*	*M*	*SD*
Accommodation and service facilities	3.25	0.90	3.00	0.78
Non-consumptive activities	4.37	0.52	4.20	0.54
Sport/recreation facilities	2.84	1.05	2.74	1.11
Motorized activities	2.86	0.73	3.44	0.93
Consumptive activities	2.69	1.07	3.19	1.03
Visitor facilities	3.83	0.77	3.99	0.74

A MANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 137$, Chinese, $n = 154$, and sex, females, $N = 129$, males, $N = 162$) and the three covariates was performed on the six factors. The Box's M test indicated that the assumption of homogeneity of variance-covariance across groups was not met, $F(63, 173115) = 1.52$, $p = .005$. However, the F value is small, suggesting the violation of the assumption is not a major concern (Rodgers, 2003). The assumption of homogeneity of regression slopes was met for all three covariates as none of the interaction effects was significant ($p > .05$) (Table 4-50). This indicates that the use of MANCOVA is feasible. In addition, none of the interaction effects between each pair of the three covariates was significant ($p > .05$) (Table 4-51), indicating that the inclusion of the three independent variables as covariates is appropriate. The results of the MANCOVA are presented in Table 4-52.

Table 4-50

Tests of Homogeneity of Regression for National Park Appropriate Uses

Source	Wilks' Λ	*F*	*df*	*p*
Ethnicity * Income	0.88	0.94	24, 629	.544
Ethnicity * Education	0.92	1.21	12, 360	.275
Ethnicity * Age	0.85	0.97	30, 722	.518
Sex * Income	0.86	1.05	24, 584	.397
Sex * Education	0.95	0.68	12, 334	.771
Sex * Age	0.87	0.81	30, 670	.762

Note. Interactions were tested separately on ethnicity and sex.

Table 4-51

Test of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for National Park Appropriate Uses

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.82	0.78	72, 1480	.909
Income * Age	0.76	0.69	108, 1514	.993
Education * Age	0.70	1.26	84, 1584	.059

Note. Interactions were tested separately on each pair.

Table 4-52

Multivariate Analysis of Covariance for National Park Appropriate Uses

Effect	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	.98	0.96	6, 279	.453	.02	.38
Education	.95	2.65*	6, 279	.016	.05	.86
Age	.96	2.15*	6, 279	.048	.04	.76
Ethnicity (E)	.73	17.23**	6, 279	.000	.27	1.00
Sex (S)	.93	3.45**	6, 279	.003	.07	.94
E * S	.97	1.59	6, 279	.150	.03	.61

Note. $*p < .05$, $**p < .001$.

After holding the demographic characteristics constant and considering the interaction between sex and ethnicity, Anglo-Canadians and Chinese did differ overall in regard to their attitudes toward national park appropriate uses, Wilks' Λ = .73, F (6, 279) = 17.23, $p < .001$ (Table 4-52). The partial eta square of .27 indicates that 27% of the variance in the six scales can be attributed to the main effect of ethnicity. According to

Weinfurt (1995), a value of .27 indicates a large effect size. In addition, the probability of correctly rejecting the null hypothesis when it is false is 1.00 ($\beta = 1.00$). It should be noted that the main effects of education and age (at the significance level of .05), and sex (at the significance level of .001) were significant. However, there is no significant interaction effect between ethnicity and sex ($p > .05$).

Follow-up ANCOVAs were then performed separately on the six sub-scales. For scale 1, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, n = 144, Chinese, n = 159, and sex, females, N = 134, males, N = 169) and the three covariates was computed. The results of this analysis are presented in Table 4-53. Levene's test of equality of error variances across groups was met for this scale, F (3, 299) = 1.65, $p > .05$.

Table 4-53

Analysis of Covariance for National Park Appropriate Uses-Accommodation and Service Facilities

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.02	0.03	1, 296	.864	.00	.05
Education	4.90	7.20**	1, 296	.008	.02	.76
Age	0.19	0.28	1, 296	.598	.00	.08
Ethnicity (E)	6.93	10.19**	1, 296	.002	.03	.89
Sex (S)	2.33	3.42	1, 296	.065	.01	.45
E * S	4.47	6.57*	1, 296	.011	.02	.72

Note. Mean squares were calculated based on the Type III sum of squares; $^*p < .05$, $^{**}p < .0083$ (i.e., $p = .05/6$, where 6 refers to the number of sub-scales).

Table 4-53 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 296) = 10.19$, $p < .0083$, the Bonferroni adjusted significance level, suggesting there did exist significant difference between the two groups in attitudes toward the accommodation and service facilities of national parks with Anglo-Canadians ($M = 3.25$, $SD = 0.90$) being more likely than Chinese ($M = 3.00$, $SD = 0.78$) to consider that accommodation and service facilities are appropriate in Canada's national parks. In addition, the main effect of education was significant at the Bonferroni adjusted level ($p < .0083$), as was the interaction effect between ethnicity and sex ($p < .05$), albeit not at the Bonferroni adjusted level.

A further examination of the interaction means by Tukey's Honestly Significant Difference (HSD) procedure (cf. Lee, 1999) suggested that there is no effect ($p > .05$) within the Chinese group, while there is an effect ($p < .05$) between Anglo females ($M = 3.03$, $SD = 0.89$) and males, ($M = 3.44$, $SD = 0.85$). That is, Anglo-Canadians females are less likely than their male counterparts to consider accommodation and service facilities to be appropriate. While there is no difference between Anglo-Canadian females and Chinese females or males, there does exist significant difference ($p < .01$) between Anglo-Canadian males and Chinese females ($M = 3.01$, $SD = 0.83$) or males ($M = 2.99$, $SD = 0.75$). These statistics indicate that Anglo-Canadian males are more likely than Chinese females or males to consider accommodation and service facilities to be appropriate (Table 4-54).

Table 4-54.

Mean Differences for All Possible Paired Comparisons (diff(i - j) = row$_i$ - column$_j$))- Accommodation and Service Facilities

Ethnicity			Anglo-Canadians		Chinese	
	Sex		Females	Males	Females	Males
		Mean	3.03	3.44	3.01	2.99
Anglo-Canadians	Females	3.03		-0.41*	0.02	0.04
	Males	3.44			0.43**	0.45**
Chinese	Females	3.01				0.02
	Males	2.99				

Note. *$p < .05$ and **$p < .01$ using Tukey's HSD procedure.

For scale 2, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 145$, Chinese, $n = 155$, and sex, females, $N = 134$, males, $N = 166$) and the three covariates was computed and the results were presented in Table 4-55. Levene's test of equality of error variances across groups was met for this scale, F (3, 296) = 1.19, $p > .05$.

Table 4-55

Analysis of Covariance for National Park Appropriate Uses-Non-Consumptive Activities

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.32	1.15	1, 293	.285	.00	.19
Education	0.02	0.08	1, 293	.780	.00	.06
Age	1.00	3.59	1, 293	.059	.01	.47
Ethnicity (E)	2.25	8.10*	1, 293	.005	.03	.81
Sex (S)	0.08	0.29	1, 293	.591	.00	.08
E * S	0.38	1.38	1, 293	.241	.00	.22

Note. Mean squares were calculated based on the Type III sum of squares; *$p < .0083$ (i.e., $p = .05/6$, where 6 refers to the number of sub-scales).

Table 4-55 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, F (1, 293) = 8.10, $p < .0083$, the Bonferroni adjusted significance level. This finding indicates that there did exist significant difference between the two groups in attitudes toward non-consumptive activities of national parks, and that Anglo-Canadians (M = 4.37, SD = 0.52) were more likely than Chinese (M = 4.20, SD = 0.54) to consider non-consumptive activities to be appropriate in Canada's national parks. However, all other main effects and the interaction effect were not significant ($p > .05$).

For scale 3, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, n = 145, Chinese, n = 160, and sex, females, N = 136, males, N = 169) and the three covariates was computed. The results of this analysis are presented in Table 4-56. Levene's test of equality of error variances across groups was met for this scale, F (3, 301) = 1.49, $p > .05$.

Table 4-56

Analysis of Covariance for National Park Appropriate Uses-Sports/Recreation Facilities

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.76	0.66	1, 298	.417	.00	.13
Education	0.17	0.14	1, 298	.705	.00	.07
Age	0.21	0.18	1, 298	.674	.00	.07
Ethnicity (E)	0.02	0.02	1, 298	.891	.00	.05
Sex (S)	0.0	0.00	1, 298	.951	.00	.05
E * S	7.09	6.13*	1, 298	.014	.02	.69

Note. Mean squares were calculated based on the Type III sum of squares; *$p < .05$.

Table 4-56 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was not significant, $F(1, 298) = 0.02$, $p > .05$. This suggests that there was no significant difference between the two groups in attitudes toward sport/recreation facilities of national parks. Additionally, all other main effects were not significant ($p > .05$). It should be noted that the interaction effect between ethnicity and sex was significant ($p < .05$), albeit not at the Bonferroni adjusted level ($p < .0083$). However, a further examination of the interaction means by Tukey's Honestly Significant Difference (HSD) procedure (cf. Lee, 1999) suggested that there is no significant effect ($p > .05$) within each group nor is there significant effect between females and males of the two groups (Table 4-57).

Table 4-57

Mean Differences for All Possible Paired Comparisons (diff(i - j) = row$_i$ - column$_j$))- Sports/Recreation Facilities

Ethnicity			Anglo-Canadians		Chinese	
	Sex		Females	Males	Females	Males
		Mean	2.63	3.02	2.91	2.61
Anglo-Canadians	Females	2.63		-0.39	-0.28	0.02
	Males	3.02			0.11	0.41
Chinese	Females	2.91				0.30
	Males	2.61				

Note. Differences were tested using Tukey's HSD procedure.

For scale 4, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 144$, Chinese, $n = 159$, and sex, females, $N = 134$, males, $N = 169$) and the three covariates were computed and the results are presented in Table 4-58. Levene's test of equality of error variances across groups was met for this scale, $F(3, 299) = 2.27$, $p > .05$.

Table 4-58 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 296) = 36.17$, $p < .0083$, the Bonferroni adjusted level, suggesting that significant differences do exist between the two groups in attitudes toward motorized activities of national parks, and that Anglo Canadians ($M = 2.86$, $SD = 0.73$) were less likely than Chinese ($M = 3.44$, $SD = 0.93$) to consider that motorized activities are appropriate in Canada's national parks. Additionally, the main effect of sex was significant at the Bonferroni adjusted level ($p < .0083$), suggesting that females ($M = 3.31$,

Table 4-58

Analysis of Covariance for National Park Appropriate Uses-Motorized Activities

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.02	0.02	1, 296	.875	.00	.05
Education	0.15	0.22	1, 296	.637	.00	.08
Age	1.79	2.62	1, 296	.107	.01	.36
Ethnicity (E)	24.77	36.17**	1, 296	.000	.11	1.00
Sex (S)	6.39	9.33**	1, 296	.002	.03	.86
E * S	3.56	5.20*	1, 296	.023	.02	.62

Note. Mean squares were calculated based on the Type III sum of squares; *$p < .05$, **$p < .0083$ (i.e., $p < .05/6$, where 6 refers to the number of sub-scales).

SD = 0.95) are more likely than males (*M* = 3.05, *SD* = 0.82) to consider motorized activities to be appropriate in Canada's national parks. It should be noted that the interaction effect between ethnicity ans sex was significant ($p < .05$), albeit not at the Bonferroni adjusted level ($p < .0083$).

A further examination of the interaction means by Tukey's Honestly Significant Difference (HSD) procedure suggested that Anglo-Canadian females are not significantly different from their male counterparts ($p > .05$), while there is a significant effect ($p < .01$) between Chinese females (*M* = 3.75, *SD* = 0.89) and males (*M* = 3.21, *SD* = 0.90). That is, Chinese females are more likely than their male counterparts to consider motorized activities to be appropriate. While there is no significant effect between Anglo-Canadian females and Chinese males, Anglo-Canadian females (*M* = 2.87, *SD* = 0.80) are significantly different from Chinese females ($p < .01$). This indicates that Chinese females are more likely than Chinese males or Anglo-Canadian females and males to consider motorized activities to be appropriate (Table 4-59).

Table 4-59

Mean Differences for All Possible Paired Comparisons (diff(i - j) = row$_i$ - column$_j$))- Motorized Activities

Ethnicity			Anglo-Canadians		Chinese	
	Sex		Females	Males	Females	Males
		Mean	2.87	2.85	3.75	3.21
Anglo-Canadians	Females	2.87		0.02	-0.88**	-0.34
	Males	2.85			-0.90**	-0.36*
Chinese	Females	3.75				0.54**
	Males	3.21				

Note. *$p < .05$ and **$p < .01$ using Tukey's HSD procedure.

For scale 5, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, n = 146, Chinese, n = 160, and sex, females, $N = 135$, males, $N = 171$) and the three covariates was computed and the results are presented in Table 4-60. Levene's test of equality of error variances across groups was met for this factor, $F(3, 302) = 0.67$, $p > .05$.

Table 4-60 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 299) = 10.75$, $p < .0083$, at the Bonferroni adjusted level, suggesting there did exist a significant difference between both groups in attitudes toward consumptive activities of national parks, and that Anglo-Canadians ($M = 2.69$, $SD = 1.07$) were less likely than Chinese ($M = 3.19$, $SD = 1.03$) to consider that consumptive activities to be appropriate in Canada's national parks. All other main effects and the interaction effect between ethnicity and sex were not significant ($p > .05$).

Table 4-60

Analysis of Covariance for National Park Appropriate Uses-Consumptive Activities

Effect	*MS*	*F*	*df*	*P*	η_p^2	β
Income	1.19	1.04	1, 299	.308	.00	.17
Education	0.06	0.06	1, 299	.814	.00	.06
Age	0.55	0.48	1, 299	.488	.00	.11
Ethnicity (E)	12.21	10.75*	1, 299	.001	.03	.90
Sex (S)	1.07	0.94	1, 299	.333	.00	.16
E * S	0.21	0.18	1, 299	.670	.00	.07

Note. Mean squares were calculated based on the Type III sum of squares; $^*p < .0083$ (i.e., $p = .05/6$, where 6 refers to the number of sub-scales).

For factor 6, ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 147$, Chinese, $n = 160$, and sex, females, $N = 136$, males, $N = 171$) and the three covariates was computed and the results are presented in Table 4-61. Levene's test of equality of error variances across groups was met for this sub-scale, $F(3, 303) = 0.71$, $p > .05$.

Table 4-61 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was not significant, $F(1, 300) = 2.65$, $p \geq .05$, suggesting there did not exist significant difference between both groups in attitudes toward visitor facilities of national parks. In addition, all other main effects and the interaction effect were not significant ($p > .05$).

Table 4-61

Analysis of Covariance for National Park Appropriate Uses-Visitor Facilities

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.04	.08	1, 300	.782	.00	.06
Education	0.24	.43	1, 300	.512	.00	.10
Age	0.38	.70	1, 300	.404	.00	.13
Ethnicity (E)	1.46	2.65	1, 300	.105	.01	.37
Sex (S)	0.07	.12	1, 300	.725	.00	.06
E * S	1.17	2.13	1, 300	.146	.01	.31

Note. Mean squares were calculated based on the Type III sum of squares.

Based on the above analyses, **H5: There exist significant differences in attitudes toward appropriate use of Canada's national parks between Chinese in Canada and Anglo-Canadians** was supported by the MANCOVA, and by four of the six ANCOVAs.

That is, in comparison with Anglo-Canadians, Chinese are more likely than Anglo-Canadians to consider consumptive activities (i.e., gathering natural edible products and fishing), motorized activities (i.e., sightseeing by car and power boating) to be appropriate, while less likely to perceive non-consumptive activities (i.e., camping, rock-climbing/mountaineering, hiking/backpacking, etc.), and accommodation and service facilities (i.e., hotel/motel accommodation, residency/permanent homes, grocery stores and laundromats, etc.) to be appropriate within Canada's national parks. These differences are significant at the Bonferroni adjusted level ($p < .0083$). Specifically, Anglo-Canadian males are more likely than Anglo-Canadian females, and even more so in relation to Chinese females and males to consider accommodation and service facilities to be appropriate. Chinese, but particularly Chinese females, are more likely than Anglo males and females to consider motorized activities to be appropriate. There are no significant differences in attitudes toward sports/recreation facilities and visitor facilities between the two groups.

Hypothesis Test: Acculturation

In order to test H6: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of appropriate use within Canadian national parks, a MANCOVA was first performed on the six sub-scales, and follow-up pair comparisons were then tested.

The means and standard deviations for the three groups--Anglo-Canadians, Chinese with high acculturation, and Chinese with low acculturation--are presented in Table 4-62. Acculturation affect attitudes toward accommodation and service facilities, where the mean of 3.15 for Chinese with high acculturation is closer to the mean of 3.25 for Anglo-

Canadians than the mean of 2.89 for Chinese with low acculturation. In the case of motorized activities, where the mean of 3.28 for Chinese with high acculturation is closer to the mean of 2.86 for Anglo-Canadians than the mean of 2.70 for Chinese with low acculturation. With reference to consumptive activities, the mean of 2.91 for Chinese with high acculturation falls somewhere between the mean of 2.69 for Anglo-Canadians and the mean of 3.34 for Chinese with low acculturation. For visitor activities, acculturation acts in the anticipated direction. However, the difference between the mean of 3.83 for Anglo-Canadians and the mean of 4.04 for Chinese with high acculturation is much greater than that of the above three pairs of means. Finally, acculturation does not act as hypothesized for non-consumptive activities and sport/recreation facilities because the means for Chinese with low acculturation are closer to the means for Anglo-Canadians than the means for Chinese with high acculturation.

Table 4-62

Descriptive Statistics for the Six Sub-Scales of National Park Appropriate Uses-Acculturation

			Chinese			
	Anglo-Canadians		High Acculturation		Low acculturation	
Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*
Accommodation and service facilities	3.25	0.89	3.15	0.69	2.89	0.91
Non-consumptive activities	4.37	0.52	4.10	0.56	4.25	0.48
Sport/recreation facilities	2.84	1.05	2.62	0.85	2.86	1.32
Motorized activities	2.86	0.73	3.28	0.83	3.70	1.01
Consumptive activities	2.69	1.07	2.91	1.01	3.34	0.97
Visitor facilities	3.83	0.77	4.04	0.68	4.07	0.80

In order to statistically test the differences in the six sub-scales among the three groups, a MANCOVA with two grouping factors (i.e., acculturation, Anglo-Canadians, $n = 137$, Chinese with high acculturation, $n = 53$, and Chinese with low acculturation, $n = 48$; and sex, female, $N = 107$, male, $N = 131$) and three covariates (i.e., age, education, and income) was performed on the six dependent variables (i.e., the six sub-scales). Although the Box's M test indicates that the homogeneity of variance-covariance was not met, F (105, 28908) = 1.32, $p = .015$, the departures from homogeneity of variance-covariance are only minor or inconsequential taking into account the small F value (Rodgers, 2003). The assumption of homogeneity of regression slopes was met for all three covariates as none of the interaction effects was significant ($p > .05$) (Table 4-63). In addition, none of the interaction effects between income, education, and age was significant ($p > .05$), suggesting the inclusion of the three independent variables as covariates was feasible (Table 4-64). The results of the MANCOVA are presented in Table 4-65.

Table 4-63

Tests of Homogeneity of Regression for National Park Appropriate Uses-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*
Acculturation * Income	0.35	0.94	48, 732	.583
Acculturation * Education	0.86	0.77	24, 409	.772
Acculturation * Age	0.61	1.15	54, 601	.219
Sex * Income	0.82	1.02	24, 420	.434
Sex * Education	0.89	1.20	12, 240	.286
Sex * Age	0.82	0.85	30, 482	.705

Note. Interactions were tested separately on acculturation and sex.

Table 4-64

Tests of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for National Park Appropriate Uses-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.78	0.79	72, 1191	.903
Income * Age	0.72	0.65	108, 1211	.997
Education * Age	0.64	1.28	84, 1272	.051

Note. Interactions were tested separately on each pair.

Table 4-65

Multivariate Analysis of Covariance for National Park Appropriate Uses-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	0.98	0.74	6, 224	.616	.02	.29
Education	0.96	1.59	6, 224	.151	.04	.61
Age	0.95	1.79	6, 224	.101	.05	.67
Acculturation (A)	0.67	8.11*	12, 448	.000	.18	1.00
Sex (S)	0.92	3.14*	6, 224	.006	.08	.92
A * S	0.93	1.43	12, 448	.148	.04	.78

Note. $^*p < .001$.

As noted in Table 4-65, after holding the demographic characteristics constant and considering the interaction between acculturation and sex, the three groups did differ overall in regard to their attitudes toward national park appropriate uses, Wilks' Λ = 0.67, $F(12, 448) = 8.11, p < .001$. It was estimated that 18% of the variance in the six dependent variables can be attributed to group membership ($\eta_p^2 = .18$), and the probability of rejecting the null hypothesis when it is false is 1.00 ($\beta = 1.00$). The main effect of sex was significant, Wilks' $\Lambda = 0.92$, F (6, 224) = 3.14, $p < .001$. However, neither of the main effects with regards to income, education, and age nor the interaction effects between group membership and sex was significant ($p > .05$).

As the above analysis indicates, there did exist significant differences in attitudes towards appropriate uses within national parks among the three groups. The significant simple main effect of group membership was further analyzed by pairwise comparisons using the Bonferroni adjustment for multiple comparisons. Table 4-66 presents the results of this analysis for estimated marginal means. The pairwise comparisons are presented in Table 4-67.

Table 4-66

Estimated Marginal Means for National Park Appropriate Uses

Dependent Variable	Groups	*M*	*SE*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Scale 1	Anglo-Canadians	3.28	0.08	3.12	3.43
	High acculturation	3.06	0.13	2.81	3.31
	Low acculturation	2.88	0.13	2.63	3.13
Scale 2	Anglo-Canadians	4.37	0.05	4.28	4.47
	High acculturation	4.08	0.08	3.93	4.24
	Low acculturation	4.25	0.08	4.10	4.41
Scale 3	Anglo-Canadians	2.80	0.10	2.61	2.99
	High acculturation	2.64	0.16	2.33	2.96
	Low acculturation	2.93	0.16	2.61	3.24

(*Table continues*)

Table 4-66. (*continued*)

Dependent Variable	Groups	*M*	*SE*	95% Confidence Interval Lower Bound	Upper Bound
Scale 4	Anglo-Canadians	2.82	0.07	2.68	2.97
	High acculturation	3.42	0.12	3.18	3.66
	Low acculturation	3.74	0.12	3.50	3.98
Scale 5	Anglo-Canadians	2.73	0.10	2.54	2.92
	High acculturation	2.83	0.16	2.52	3.15
	Low acculturation	3.28	0.16	2.97	3.59
Scale 6	Anglo-Canadians	3.82	0.07	3.68	3.95
	High acculturation	4.01	0.11	3.78	4.23
	Low acculturation	4.11	0.11	3.89	4.33

Note. Means evaluated at covariates appeared in the model: Income = 2.79, Education = 2.86, Age = 2.92.

Table 4-67

Pairwise Comparisons for National Park Appropriate Uses

Dependent variables	Groups		Mean difference (I – J)	*SE*	*p*	95% Confidence Interval	
	I	J				Lower Bound	Upper Bound
Scale 1	High acculturation	Low acculturation	0.19	0.17	.866	-0.24	0.61
		Anglo-Canadians	-0.21	0.16	.516	-0.59	0.16
	Low acculturation	Anglo-Canadians	-0.40*	0.15	.029	-0.77	-0.03
Scale 2	High acculturation	Low acculturation	-0.17	0.11	.341	-0.43	0.09
		Anglo-Canadians	-0.29**	0.10	.008	-0.53	-0.06
	Low acculturation	Anglo-Canadians	-0.12	0.09	.599	-0.35	0.11
Scale 3	High acculturation	Low acculturation	-0.28	0.22	.599	-0.81	0.25
		Anglo-Canadians	-0.16	0.20	1.000	-0.63	0.31
	Low acculturation	Anglo-Canadians	0.12	0.19	1.000	-0.34	0.59

(*Table continues*)

Table 4-67. (*continued*)

Dependent variables	Groups I	Groups J	Mean difference (I – J)	*SE*	*p*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Scale 4	High acculturation	Low acculturation	-0.32	0.17	.163	-0.72	0.08
		Anglo-Canadians	0.60**	0.15	.000	0.24	0.95
	Low acculturation	Anglo-Canadians	0.92**	0.15	.000	0.57	1.27
Scale 5	High acculturation	Low acculturation	-0.45	0.22	.121	-0.97	0.08
		Anglo-Canadians	0.10	0.19	1.000	-0.36	0.57
	Low acculturation	Anglo-Canadians	0.55*	0.19	.012	0.09	1.01
Scale 6	High acculturation	Low acculturation	-0.10	0.16	1.000	-0.48	0.27
		Anglo-Canadians	0.19	0.14	.503	-0.14	0.53
	Low acculturation	Anglo-Canadians	0.29	0.14	.097	-0.04	0.62

Note. The multiple comparisons based on estimated marginal means with adjustment Bonferroni; *p < .05, **p < .001.

As shown in the Table 4-67, hypothesis six was supported by findings in three (i.e., scale 1, scale 5, and scale 6) of the six scales. For scale 1, accommodation and service facilities, Chinese with low acculturation (*M* = 2.88, *SE* = 0.13) were significantly different (at the adjustment Bonferroni level) from Anglo-Canadians (*M* = 3.28, *SE* = 0.08), while Chinese with high acculturation (*M* = 3.06, *SE* = 0.13) were not significantly different from Anglo-Canadians nor from their Chinese counterparts. This finding strongly supports hypothesis six. The same pattern was repeated in scale 5, consumptive activities, where Chinese with low acculturation (*M* = 3.28, *SE* = 0.16) were significantly different (at the adjustment Bonferroni level) from Anglo-Canadians (*M* = 2.73, *SE* = 0.10), while Chinese with high acculturation (*M* = 2.83, *SE* = 0.16) were not significantly different from Anglo-Canadians nor from their Chinese counterparts. Likewise, hypothesis six was strongly supported in this scale. In addition, this hypothesis was moderately supported in scale 6, where Chinese with low acculturation (*M* = 4.11, *SE* = 0.11) were significantly different ($p < .05$) (i.e., $p = .097/3 = .032$), albeit not at the Bonferroni adjusted level, from Anglo-Canadians (*M* = 3.82, *SE* = 0.07), while Chinese with high acculturation (*M* = 4.01, *SE* = 0.11) were not significantly different from Anglo-Canadians nor from their Chinese counterparts.

However, the hypothesis was not supported by the other three scales (i.e., scale 2, scale 3, and scale 4). For scale 2, non-consumptive activities, whereas there were no significant differences between Chinese with low acculturation and Anglo-Canadians as well as between the two Chinese sub-groups, there did exist significant difference between Chinese with high acculturation (*M* = 4.08, *SE* = 0.08) and Anglo-Canadians (*M* = 4.37, *SE* = 0.05). For scale 3, sport/recreation facilities, there were no significant differences among the three groups. Finally, for scale 4, Anglo-Canadians ($M = 2.82$, $SE = 0.07$) were not only significantly different from Chinese with low acculturation ($M = 3.74$, $SE = 0.12$), but also from Chinese with high acculturation ($M = 3.42$, $SE = 0.12$), while the two Chinese sub-groups were not significantly different from each other.

Based on the above, **H6**: **The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of appropriate use within Canada's national parks** was supported by the follow-up pairwise comparisons with respect to the three scales of accommodation and service facilities (scale 1), consumptive activities (scale 5) and visitor facilities (scale 6). That is, statistically speaking, the more acculturated a Chinese person was, the more likely he or she would share similar attitudes with those held by Anglo-Canadians in terms of appropriate use with regard to the three dimensions within Canada's national parks. It should be noted, however, that the other three aspects of appropriate use such as non-consumptive activities (scale 2), sport/recreation facilities (scale 3), and motorized activities (scale 4) did not support this hypothesis.

Within Group Issues

For each group, correlation analyses were conducted to examine the relationships among the six scales. The results are presented in Table 4-68 and Table 4-69. In addition, for Anglo-Canadians, each scale will be regressed on sex, age, education, income, and frequencies to national parks. One more variable, acculturation, was added with regard to regression analyses for the Chinese.

Table 4-68

Zero-Order Pearson Correlation Coefficients among National Park Appropriate Use Sub-Scales for Anglo-Canadians (Maximum N = 159)

	A	N	S	M	C	V
Accommodation and service facilities (A)	_					
Non-consumptive activities (N)	.47**	_				
	(.000)					
Sport/recreation facilities (S)	.55**	.41**	_			
	(.000)	(.000)				
Motorized activities (M)	.24**	.33**	.37**	_		
	(.002)	(.000)	(.000)			
Consumptive activities (C)	.02	.19*	.12	.27**	_	
	(.857)	(.017)	(.154)	(.001)		
Visitor facilities (V)	.60**	.41**	.38**	.33**	.05	_
	(.000)	(.000)	(.000)	(.000)	(.508)	

Note. Values in parentheses refer to p values; $*p < .05$, $**p < .001$.

Table 4-69

Zero-Order Pearson Correlation Coefficients among National Park Appropriate Use Sub-Scales for the Chinese (Maximum N = 175)

	A	N	S	M	C	V
Accommodation and service facilities (A)	–					
Non-consumptive activities (N)	.36**	–				
	(.000)					
Sport/recreation facilities (S)	.45**	.12	–			
	(.000)	(.130)				
Motorized activities (M)	.44**	.39**	.42**	–		
	(.000)	(.000)	(.000)			
Consumptive activities (C)	.07	.27**	.18*	.14	–	
	(.357)	(.000)	(.017)	(.069)		
Visitor facilities (V)	.38**	.28**	.24**	.35**	.03	–
	(.000)	(.000)	(.002)	(.000)	(.661)	

Note. Values in parentheses refer to p values; *$p < .05$, **$p < .001$.

Anglo-Canadians. Table 4-68 shows all six scales were positively related. In addition, five scales--accommodation and service facilities, non-consumptive activities, sport/recreation facilities, motorized activities, and visitor facilities--were significantly related to one another ($p < .001$). However, scale 5, consumptive activities, was not significantly related to accommodation and service facilities, sport/recreation facilities, and visitor facilities ($p > .05$) but was significantly related to non-consumptive activities ($p < .05$) and motorized activities ($p = .001$).

Regression analyses indicated that none of the five variables, sex, age, education, income, and frequencies to national parks, was found to be significantly related to each of the three scales, non-consumptive activities, consumptive activities, and visitor facilities ($p > .05$). Sex was the single variable that was significantly related to scale 1 ($p < .001$) and scale 3 ($p < .05$) with males considering accommodation and service facilities and sport/recreation facilities to be more appropriate than females. In contrast, the scale, motorized activities, was only significantly related to education ($p < .001$) with those with higher levels of education considering motorized activities to be less appropriate than those with lower levels of education.

Chinese. Among the Chinese, the relationship patterns were similar as compared with Anglo-Canadians. For instance, all six scales were also positively related. In addition, five scales--accommodation and service facilities, non-consumptive activities, sport/recreation facilities, motorized activities, and visitor facilities--were significantly related to one another ($p < .001$) except that the scale, non-consumptive activities, was not significantly related to the scale, sport/recreation facilities ($p > .05$). The scale, consumptive activities, was not significantly related to the scale, accommodation and service facilities, and the scale, visitor facilities, as it was not for Anglo-Canadians. However, it was not significantly related to the scale, motorized activities ($p > .05$) while it was among Anglo-Canadians. In addition, the scale, consumptive activities, was significantly related to non-consumptive activities ($p < .001$) and sport/recreation facilities ($p < .05$).

Regression analyses indicated that none of the six variables (i.e., sex, age, education, income, frequencies to national parks, and acculturation) was significantly related to any of the four scales, accommodation and service facilities, non-consumptive activities, consumptive activities, and visitor facilities ($p > .05$). Sex was the only variable that was significantly related to scale 3 ($p < .05$), with females being more supportive of sport/recreation facilities than males. Sex was also significantly related to scale 4 ($p < .001$) with females considering motorized activities being more appropriate than males. In addition, acculturation was significantly related to this scale ($p < .05$), with those who were high acculturated being less likely to consider these activities to be appropriate than those who were low acculturated.

Conclusion

This sub-section compared the frequency of response between the two groups, Anglo-Canadians and Chinese, with respect to their attitudes toward the revised policy, roles and functions, and appropriate use of national parks; determined the latent variables for each of three measures using factor analysis; and tested the three hypotheses on ethnicity and other three on acculturation.

The results indicate:

1. The response patterns for the two groups with reference to a large number of items measuring the attitudes toward the three aspects of national parks were similar. That is, where the majority of Anglo-Canadians or a small number of them responded in some items, a majority of the Chinese or a small number of them responded in the same items. However, Chinese respondents were more likely to choose the middle ones and less likely to choose the extremes along a spectrum of choices. This is particularly true in the case of attitudes toward national park policy. By comparing the frequency of responses of the two groups in the "strongly disagree" or "strongly agree" category in attitudes toward policy to that of attitudes toward roles and functions and appropriate uses, it was found that the frequency in this regard is less concentrated and more evenly distributed among all levels, indicating that people's understanding on Parks Canada policy on national parks was more diverse. This is reflected by the similarity index (see

Appendix G) (at the 95% level of similarity), which is 2.1, 2.32, and 2.95 for park policy, roles and functions, and appropriate use, respectively, where park policy had the lowest of all.

2. Each of the three measures was not unidimensional with national park policy, roles and functions, and appropriate use having two, three, and six dimensions, respectively.

3. The two groups did differ overall in attitudes toward the three aspects, but in not all of the dimensions. Specifically, the attitudes held by the Chinese group toward national park policy were significantly different from those held by the Anglo-Canadian group. That is, the Chinese respondents were less likely than their Anglo-Canadian counterparts to support Park Canada's policy on the protection of ecological integrity of park resources and environments. In the case of national park roles and functions, the two groups did not differ in attitudes toward national parks as places for the protection of ecological integrity and as places for the provision of leisure opportunities, while they did differ in attitudes toward the non-market values of national parks. Finally, in terms of national park appropriate uses, there were no significant differences between the two groups in attitudes toward sports/recreation activities and visitor facilities, while the two groups did differ in attitudes toward accommodation and services facilities, non-consumptive activities, motorized activities, and consumptive activities, with the Chinese group being less likely than the Anglo-Canadian group to consider accommodation and service facilities and non-consumptive activities to be appropriate but more likely to consider motorized activities and consumptive activities to be appropriate within Canada's national parks.

4. The hypotheses regarding acculturation were not supported by findings on national park policy nor by national park roles and functions but were partially supported

by appropriate use. That is, acculturation did not play a role in influencing the attitudes held by the Chinese respondents toward national park policy as well as national park roles and functions, while it partially affected Chinese respondents' attitudes toward the appropriate use of national parks. That is, the more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of accommodation and service facilities, consumptive activities and visitor facilities. However, the other three aspects of appropriate use such as non-consumptive activities, sport/recreation facilities, and motorized activities did not support the hypothesis.

5. There was no significant relationship between visitation to national parks and attitudes toward national park. This holds true for both groups.

6. People's attitudes toward national parks are generally homogenous within each cultural group. Relatively, sex seemed to be a more important factor than age, education, and income that affected attitudes toward national parks held by both groups.

Environment

This sub-section presents the findings on respondents' attitudes of the two groups toward the environment. Descriptive statistics, factor analysis, MANCOVAs and ANCOVAs are presented with respect to environmental values and attitudes. Five hypotheses are tested in this sub-section.

Environmental Values

Descriptive Statistics

Table 4-70 illustrates the frequency, means and standard deviations for environmental values. Apart from item 1, which had the greatest frequency of response in the "quite important" category for both groups, all the remaining items had the greatest frequency of

Table 4-70

Percent, Means and Standard Deviations for Environmental Values

	Percent of respondents					Descriptive statistics	
	Importance						
Items	Not at all	2	3	4	Extremely	*M*	*SD*
1. Unity with nature	0.0	3.8	14.6	45.9	35.7	4.13	0.80
	1.1	2.2	21.9	42.7	32.0	4.02	0.86
2. Protecting the environment	0.0	0.6	5.0	22.0	72.3	4.66	0.60
	0.0	0.0	3.4	22.5	74.2	4.71	0.53
3. Preventing pollution	0.6	0.0	2.5	15.6	81.3	4.77	0.55
	0.0	0.6	2.2	18.0	79.2	4.76	0.51
4. Respecting the Earth	0.0	0.6	4.4	18.2	76.7	4.71	0.58
	0.0	0.0	2.8	27.0	70.2	4.67	0.53
5. A world at peace	1.9	0.6	13.8	21.4	62.3	4.42	0.89
	2.8	0.0	3.9	16.9	76.4	4.64	0.81
6. Equality	1.3	5.1	17.3	21.2	55.1	4.24	1.00
	2.2	0.0	6.2	19.7	71.9	4.59	0.80
7. Social justice	4.4	7.5	16.9	21.9	49.4	4.04	0.17
	1.1	2.2	6.7	21.9	68.0	4.53	0.81
8. Helpful	1.3	4.0	19.9	33.1	41.7	4.10	0.94
	0.6	2.3	10.7	37.9	48.6	4.32	0.80
9. A world of beauty	0.6	2.5	12.6	26.4	57.9	4.38	0.85
	0.0	0.6	7.9	33.1	58.4	4.49	0.67
10. Sense of belonging	1.9	0.6	17.2	28.7	51.6	4.27	0.90
	0.0	4.5	23.0	27.0	45.5	4.13	0.92

Note. 1. Participants were instructed: "The following is a list of environmental values that are believed to have a bearing on the environment. Please use the following scale to indicate how important or unimportant each statement is to you by circling your response." Items are measured using a 5-point scale (1 = not important at all, 5 = extremely important). 2. Values in the shaded boxes refer to Chinese respondents.

response in the "extremely important" category, and the frequency was consistently concentrated on this category. This was the case for both groups. Specifically, the top three extremely important itemsfor Anglo-Canadians are: item 2 "protecting the environment" (72.3%), item 3 "preventing pollution" (81.3%), and item 4 "respecting the earth" (76.7%). For the Chinese group, the top three were: item 3 (79.2%), and item 4 (70.2%), and item 5 "a world at peace" (76.4%). Item 3 also had the highest mean value of 4.66 out of 5 for Anglo-Canadians and 4.71 for Chinese. The lowest mean for Chinese is 4.02 in item 1 (i.e., "unity with nature") while for Anglo-Canadians the lowest mean is 4.04 for item 7 (i.e., "social justice"). All of the means are greater than 4.0 for both groups.

Obviously, the two groups shared quite similar attitudes toward all of the 10 items that were used to measure their environmental values. However, there are four items (items 5, 6, 7, 8) that visually appear to have large differences in means between the two groups. These items are associated with altruism. The mean for each of these four items for the Chinese group is consistently greater than that for Anglo group, suggesting that Chinese respondents placed more importance on the altruistic aspect of the environmental values than did their Anglo-Canadian counterparts.

Factor Analysis

Table 4-71 shows the results of factor analysis of 10 environmental value items. As indicated in the table, the 10 items consisted of three factors. Factor one has four items (i.e., items 5, 6, 7, 8), factor two has three items, and factor three has two items (i.e., items 2, 3, 4 for factor two, and items 1, and 9 for factor three). It should be noted that item 10 "sense of belonging" has substantially cross-loaded on two factors--factor one and factor three. Although the difference between the primary loading and the secondary loading is .9, which is close to .10, this item was still deleted from factor three because it is from the value cluster Schwartz (1992) called conservation, and is not conceptually related to the other two items--"unity with nature" and "a world of beauty", which are items from the bioshperic value orientation identified by Stern et al. (1993). These three factors can be labeled respectively as social-altruistic value orientation; protection; and unity with nature (see Table 4-72).

Table 4-71

Principal Components Analysis (Using Varimax Rotation) of Environmental Value Items

Category	Factor 1	Factor 2	Factor 3
Eigenvalue	4.78	1.39	1.07
Percent of variance	47.8	13.9	10.6
Cumulative percent	47.8	61.7	72.3
Items			
1. Unity with nature	-.15	.38	**.67**
2. Protecting the environment	.18	**.80**	.19
3. Preventing pollution	.32	**.81**	.06
4. Respecting the Earth	.17	**.75**	.34
5. A world at peace	**.76**	.39	.02
6. Equality	**.84**	.23	.08
7. Social justice	**.88**	.13	.18
8. Helpful	**.67**	.13	.50
9. A world of beauty	.28	.15	**.79**
10. Sense of belonging	.53	.09	**.62**

Note: 1. Loadings of 0.45 and above are in bold. 2. Difference of 0.10 was used to separate the primary and secondary loadings.

Table 4-72 lists the three factors and their corresponding loading items, and the standardized Cronbach alpha for each scale for both ethnic groups. The table shows that for Anglo-Canadians the three factors have satisfactory reliability values, ranging from .69 to .89, but for Chinese, while the reliability values for first two factors are satisfactory, the third one is relatively low with an alpha of .50. As factor 2 and factor 3 are conceptually similar, they can be combined into a second-order factor (cf. Hasegawa & Gudykunst, 1998), which could be labeled as biospheric value orientation. Therefore, two scales--social altruistic value orientation which consisted of items 5, 6, 7, and 8 and biospheric value orientation which was comprised of items 1, 2, 3, 4, and 9--will be used for further analysis. The combined factor has a reliability of .82 for Anglo-Canadians and .79 for the Chinese, respectively.

Table 4-72

Environmental Value factor Loadings and Scale Cronbach's Coefficient Alphas

		a for standardized variables		
Factor (Proportion): Scale name & items	Loadings	Anglo-Canadians	Chinese	Comments
Factor 1: Social-altruistic (47.8%)		.89	.87	Item deletion not necessary
5. A world at peace	.76			
6. Equality	.84			
7. Social justice	.88			
8. Helpful	.67			

(*Table continues*)

Table 4-72. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables Anglo-Canadians	Chinese	Comments
Factor 2: Protection (13.9%)		.84	.80	Item deletion not necessary
2. Protecting the environment	.80			
3. Preventing pollution	.81			
4. Respecting the Earth	.75			
Factor 3: Unity with nature (10.6%)		.69	.50	Item 10 was deleted
1. Unity with nature	.67			
9. A world of beauty	.79			

Hypothesis Test: Ethnicity

In order to test H7: There exist significant differences in environmental values between Chinese in Canada and Anglo-Canadians, a MANCOVA was first performed on the two scales (i.e., scale 1, social-altruistic value orientation, and scale 2, biospheric value orientation). Following the MANCOVA, separate ANCOVAs were then performed on each of the two scales.

Anglo-Canadians had less mean score on altruism than had Chinese, with 4.22 for the former and 4.53 for the latter, suggesting that Chinese tended to value altruism more than did Anglo-Canadians. However, both groups had the same mean score of 4.52 on biospheric values (Table 4-73).

Table 4-73

Descriptive Statistics for the Two Sub-Scales of Environmental Values

Scale	Anglo-Canadians		Chinese	
	M	*SD*	*M*	*SD*
Social-altruistic value orientation	4.22	0.85	4.53	0.67
Biospheric value orientation	4.52	0.52	4.52	0.43

A MANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 133$, Chinese, $n = 160$, and sex, females, $N = 130$, males, $N = 163$) and the three covariates was performed on the two scales. Box's M test indicated that the assumption of homogeneity of variance-covariance across groups was not met, F (9, 724999) = 6.27, $p < .001$. However, the F value is small and sample sizes across groups are large, suggesting the violation of the assumption is not a problem. The assumption of homogeneity of regression slopes was met (Table 4-74). In addition, none of the interaction effects between each pair of the three covariates was significant ($p > .05$) (Table 4-75). This indicates that the inclusion of the three independent variables as covariates is appropriate. The results of the MANCOVA are presented in Table 4-76.

Table 4-74

Tests of Homogeneity of Regression for Environmental Values

Source	Wilks' Λ	*F*	*df*	*p*
Ethnicity * Income	0.98	0.54	8, 378	.830
Ethnicity * Education	0.99	0.38	4, 378	.825
Ethnicity * Age	0.97	0.55	10, 378	.856
Sex * Income	0.99	0.22	8, 350	.988
Sex * Education	0.97	1.42	4, 350	.227
Sex * Age	0.91	1.66	10, 350	.090

Note. Interactions were tested separately on acculturation and sex.

Table 4-75

Test of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for Environmental Values

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.91	0.91	12, 224	.534
Income* Age	0.93	0.39	22, 224	.992
Education * Age	0.91	0.71	16, 224	.782

Note. Interactions were tested separately on each pair.

Table 4-76

Multivariate Analysis of Covariance for Environmental Values

Effect	Wilks' Λ	*F*	*df*	*p*	η_p^2	*β*
Income	1.00	0.32	2, 285	.725	.00	.10
Education	1.00	0.40	2, 285	.961	.00	.06
Age	0.99	1.49	2, 285	.228	.01	.32
Ethnicity (E)	0.95	7.11*	2, 285	.001	.05	.93
Sex (S)	0.94	9.50*	2, 285	.000	.06	.98
E * S	0.99	0.99	2, 285	.372	.01	.17

Note. $^*p \leq .001$.

Table 4-76 illustrates that after holding the demographic characteristics constant and considering the interaction between sex and ethnicity, Anglo-Canadians and Chinese did differ overall in regard to their attitudes toward environmental values, Wilks' Λ = 0.95, F (2, 285) = 7.11, $p = .001$. It is estimated that 5% of the variability in the two dependent variables was explained by ethnicity ($\eta_p^2 = .05$), and the probability of correctly rejecting the hypothesis when it is false is .93 (β = .93). It should be noted that the main effect of sex was significant, Wilks' Λ = 0.94, F (2, 285) = 9.50, $p < .001$. However, the main effects of income, education, and age were not significant ($p > .05$) and nor was the interaction effect between ethnicity and sex ($p > .05$).

Follow-up ANCOVAs were then performed separately on both scales. For scale 1, social-altruistic values, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, n = 135, Chinese, n = 160, and sex, females, N = 130, males, N = 165) and the three covariates was computed and the results are presented in Table 4-77. Levene's test of equality of error variances across groups was not met for this factor, F (3, 291) = 12.78, $p < .01$.

Table 4-77

Analysis of Covariance for Environmental Values-Social-Altruistic Value Orientation

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.24	0.44	1, 288	.509	.00	.10
Education	0.00	0.00	1, 288	.966	.00	.05
Age	0.22	0.40	1, 288	.528	.00	.10
Ethnicity (E)	6.34	11.55*	1, 288	.001	.04	.92
Sex (S)	11.01	20.05*	1, 288	.000	.07	.99
E * S	0.83	1.52	1, 288	.219	.01	.23

Note. Mean squares were calculated based on the Type III sum of squares; *$p < .025$ (i.e., $p = .05/2$, where 2 refers to the number of sub-scales).

Table 4-77 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 288) = 11.55$, $p < .025$, the Bonferroni adjusted significance level, suggesting there did exist significant difference between both groups in attitudes toward altruism, and that Anglo-Canadians ($M = 4.22$, $SD = 0.85$) were less likely than Chinese ($M = 4.53$, $SD = 0.67$) to consider altruism was an important value that has bearing on the protection of the environment . In addition, the main effect of sex was significant, $F(1, 288) = 20.05$, $p < .025$, the Bonferroni adjusted significance level. This indicates that females ($M = 4.59$, $SD = 0.57$) emphasized the value of altruism more than did males ($M = 4.21$, $SD = 0.88$). Neither of the other main effects with respect to income, education, and age nor the interaction effect between ethnicity and sex was significant ($p > .05$).

For scale 2, biospheric value orientation, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 146$, Chinese, $n = 160$, and sex, females, $N = 136$, males, $N = 170$) and the three covariates was computed and the results are presented in Table 4-78. Levene's test of equality of error variances across groups was met for this scale, $F(3, 302) = 1.96$, $p > .05$.

Table 4-78

Analysis of Covariance for Environmental Values-Biospheric Value Orientation

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.00	.00	1, 297	.988	.00	.05
Education	0.07	0.31	1, 297	.577	.00	.09
Age	1.26	5.85	1, 297	.016	.02	.67
Ethnicity (E)	0.15	0.70	1, 297	.402	.00	.13
Sex (S)	1.71	7.45*	1, 297	.005	.03	.80
E * S	0.46	2.11	1, 297	.148	.01	.30

Note. Mean squares were calculated based on the Type III sum of squares; **p* < .025 (i.e., *p* = .05/2, where 2 refers to the number of sub-scales).

Table 4-78 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was not significant, *F* (1, 297) = 0.70, $p > .05$, suggesting that a significant difference did not exist between the two groups in biospheric values. However, the main effect of sex was significant, *F* (1, 297) = 7.45, $p < .025$, at the Bonferroni adjustment level. This indicates that females (*M* = 4.60, *SD* = 0.40) emphasized biospheric values more than did males (*M* = 4.46, *SD* = 0.52). Neither of the other main effects with respect to income, education, and age nor the interaction effect between ethnicity and sex was significant ($p > .05$).

Based on the above analyses, **H7: There exist significant differences in environmental values between Chinese in Canada and Anglo-Canadians** was supported. While Chinese were more likely than Anglo-Canadians to consider altruism as an important aspect of the protection of the environment, there was no significant difference between them in bioshperic values. Interestingly, while income, education, age, and the interaction between ethnicity and sex had no significant effect on the environmental values as a whole or on the respective value aspect specifically. However, the effect of sex was significant. That is, females were more likely than males to recognize the importance of environmental values.

Hypothesis Test: Acculturation

In order to test H8: The more acculturated a Chinese person is, the more likely he or she will share similar values with those held by Anglo-Canadians, and H9: The less acculturated a Chinese, the higher retention of his or her traditional values, a MANCOVA was first performed on the two scales, and follow-up pair comparisons were then tested.

The means and standard deviations for the two scales are presented in Table 4-79. As the table indicates, acculturation works as hypothesized for the two sub-scales. That is, the means of the two scales for the Chinese with high acculturation were closer to those of Anglo-Canadians than to those of the Chinese with low acculturation. This indicates that the more acculturated a Chinese person is, the more likely he or she will share similar values with those held by Anglo-Canadians. In addition, the Chinese with low acculturation had greater means than the Chinese with high acculturation on the two scales, suggesting that the less acculturated a Chinese, the higher retention of his or her traditional values.

Table 4-79

Descriptive Statistics for the Two Sub-Scales of Environmental Values-Acculturation

			Chinese			
	Anglo-Canadians		High Acculturation		Low acculturation	
Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*
Social-altruistic value orientation	4.21	0.87	4.38	0.71	4.62	0.59
Biospheric value orientation	4.54	0.48	4.46	0.47	4.61	0.39

In order to statistically test the differences in the two scales among the three groups, a MANCOVA with two grouping factors (i.e., acculturation, Anglo-Canadians, $n = 133$, Chinese with high acculturation, $n = 48$, and Chinese with low acculturation, $n = 51$; and sex, female, $N = 107$, male, $N = 125$) and three covariates (i.e., age, education, and income) was performed on the two dependent variables. The Box's M test indicates that the homogeneity of variance-covariance was not met, $F(15, 71663) = 3.82, p < .001$. However, the departures from homogeneity of variance-covariance are only minor or inconsequential taking into account the small F value (Rodgers, 2003). The assumption of homogeneity of regression slopes was met except for age, where the interaction effect between age and sex was significant ($p < .05$) (Table 4-80). In addition, none of the interaction effects between each pair of the three covariates, indicating that the inclusion of the three variables as covariates in the MANCOVA is appropriate (Table 4-81). The results of the MANCOVA are presented in Table 4-82.

Table 4-80

Tests of Homogeneity of Regression for Environmental Values-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*
Acculturation * Income	0.89	0.94	16, 240	.521
Acculturation * Education	0.97	0.51	8, 240	.848
Acculturation * Age	0.91	0.74	16, 240	.748
Sex * Income	0.97	0.54	8, 242	.528
Sex * Education	0.97	0.98	4, 242	.420
Sex * Age	0.83	2.23*	10, 242	.014

Note. Interactions were tested separately on acculturation and sex; *$p < .05$.

Table 4-81

Tests of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for Environmental Values-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.82	1.42	24, 318	.095
Income * Age	0.80	1.11	34, 318	.320
Education * Age	0.84	1.07	28, 318	.378

Note. Interactions were tested separately on each pair.

Table 4-82

Multivariate Analysis of Covariance for Environmental Values-Acculturation

Effect	Wilks' Λ	F	*df*	*p*	η_p^2	β
Income	0.99	0.83	2, 222	.438	.01	.19
Education	1.00	0.26	2, 222	.775	.00	.09
Age	0.99	0.81	2, 222	.447	.01	.19
Acculturation (A)	0.95	2.71*	4, 444	.030	.02	.75
Sex (S)	0.97	3.52*	2, 222	.031	.03	.65
A * S	0.97	1.65	4, 444	.161	.02	.51

Note. $^*p < .05$.

As noted in Table 4-82, after holding the demographic characteristics constant and considering the interaction between acculturation and sex, the three groups did differ overall in regard to their environmental values, Wilks' $\Lambda = 0.96$, $F(4, 444) = 2.71$, $p < .05$. It was estimated that 2% of the variance in the two dependent variables can be attributed to group membership ($\eta_p^2 = .02$), and the probability of rejecting the null hypothesis when it is false is .70 ($\beta = .75$). In addition, the main effect of sex was significant, Wilks' $\Lambda = 0.97$, $F(2, 222) = 3.52$, $p < .05$. However, neither of the main effects with regards to income, education, and age nor the interaction effect between group membership and sex was significant ($p > .05$).

As the above analysis indicates, there did exist significant differences in environmental values among the three groups. The significant simple main effect of group membership was further analyzed by pairwise comparisons using the Bonferroni adjustment for multiple comparisons. Table 4-83 presents the results of this analysis for estimated marginal means. The pairwise comparisons are presented in Table 4-84.

Table 4-83

Estimated Marginal Means for Environmental Values

Dependent Variable	Groups	*M*	*SE*	95% Confidence Interval	
				Lower Bound	Upper Bound
Scale 1	Anglo-Canadians	4.24	0.07	4.10	4.38
	High acculturation	4.48	0.12	4.25	4.71
	Low acculturation	4.62	0.11	4.40	4.84
Scale 2	Anglo-Canadians	4.54	0.04	4.45	4.62
	High acculturation	4.50	0.07	4.36	4.64
	Low acculturation	4.61	0.07	4.48	4.45

Note. Means evaluated at covariates appeared in the model: Income = 2.81, Education = 2.87, Age = 2.95.

Table 4-84 indicates that the hypothesis regarding acculturation was supported by scale 1, social-altruistic values, where the Chinese respondents with low acculturation (*M* = 4.62, *SE* = 0.11) were significantly different (at the adjustment Bonferroni level) from Anglo-Canadians (*M* = 4.24, *SE* = 0.07), while there were no differences between the Chinese with high acculturation (*M* = 4.48, *SE* = 0.12) and Anglo-Canadians or the Chinese with low acculturation. However, this hypothesis was not supported by scale 2, where the three groups were not significantly different from one another.

Table 4-84

Pairwise Comparisons for Environmental Values

Dependent variables	Groups		Mean difference (I – J)	*SE*	*p*	95% Confidence Interval	
	I	J				Lower Bound	Upper Bound
Scale 1	High acculturation	Low acculturation	-0.14	0.16	1.000	-0.52	0.24
		Anglo-Canadians	0.24	0.14	.267	-0.10	0.59
	Low acculturation	Anglo-Canadians	-0.38*	0.14	.017	-.071	-0.05
Scale 2	High acculturation	Low acculturation	-0.11	0.10	.778	-0.35	0.13
		Anglo-Canadians	-0.04	0.09	1.000	-0.25	0.18
	Low acculturation	Anglo-Canadians	-0.07	0.08	1.000	-0.28	0.13

Note. The multiple comparisons based on estimated marginal means with adjustment Bonferroni; $^*p < .05$.

Based on the above, H8: **The more acculturated Chinese are, the more similar their environment values will be to those of Anglo-Canadians** was partially supported, where the more acculturated Chinese are, the more similar their environmental values on altruism are to those of Anglo-Canadians. However, the Chinese with high acculturation shared similar environmental values on biosphere with the Chinese with low acculturation and Anglo-Canadians. In addition, Table 4-84 indicates that there were no significant differences in environmental values between the two Chinese sub-group, despite that means for the Chinese with low acculturation were visually greater than that for the Chinese with high acculturation. However, the mean differences were not statistically significant. Therefore, H9: **The less acculturated a Chinese, the higher retention of his or her traditional values** was not supported statistically.

Environmental Attitudes

Descriptive Statistics

Table 4-85 shows that each group had the greatest frequency of response in either the "mildly agree" or strongly agree" category for nine out of 15 items. These items are: item 1 "we are approaching the limit of the number of people the earth can support", item 2 "humans have the right to modify the natural environment to suit their needs" (only for Chinese), item 3 "when humans interfere with nature it often produces disastrous consequences", item 5 "humans are severely abusing the environment", item 6 "the earth has plenty of natural resources if we just learn how to develop them" (only for Anglo-Canadians), item 7 "plants and animals have as much right as humans to exist", item 9 "despite our special abilities humans are still subject to the laws of nature", item 11 "the earth is like a spaceship with very limited room and resources", item 13 "the balance-of-nature is very delicate and easily upset", and item 15 "if things continue on their present course, we will soon experience a major ecological catastrophe." For Anglo-Canadian respondents, the top three frequency of responses in the "strongly agree" category are: item 9 (57.2%), item 7 (53.8%), and item 13 (46.1%). Chinese respondents indicated that the top three are: item 9 (48.3%), item 11 (42.0%), and item 7 (36.9%). Both groups had the mean of 4.36 out of 5 on item 9, the highest mean of all of the items.

Anglo-Canadians had the five highest frequency of responses in the "strongly disagree" category while Chinese respondents had none. These five items are: item 2 "humans have the right to modify the natural environment to suit their needs" (26.3%), item 4 "human ingenuity will insure that we do NOT make the earth unlivable" (25.0%), item 8 "the balance-of-nature is strong enough to cope with the impacts of modern industrial nations" (49.0%), item 10 "the so-called 'ecological crisis' facing humankind has been greatly exaggerated" (33.8%), and item 12 "humans were meant to rule over the rest of nature" (36.9%). Item 8 had the lowest mean of 1.71 out of 5 for the Anglo-Canadian group.

In contrast, Chinese respondents recorded the four highest frequency of responses in the "mildly disagree" category. These four items are: item 6 (24.9%), item 8 (44.3%), item 10 (45.8%), and item 14 (28.9%). The lowest mean for the Chinese group is 2.05 out of 5 for item 8.

Based on the descriptive analysis, the two groups had similar attitudes toward the environment/nature with respect to the consequences of humans interfering with nature (item 3), humans subjection to the laws of nature (item 9), the "ecological crisis" faced by humankind (item 10), humans control over the rest of nature (item 12), and the possibility of ecological catastrophe being experienced by humans (item 15). However, based on visual observation of the mean scores, the two groups do exhibit considerable differences on some items (i.e., items 1, 2, 4, 5, just to name a few). Further analysis of these potential differences will be presented later. Finally, when the frequency of responses in each of the five categories are compared, the phenomenon of Chinese choosing middle responses and not going to extremes is once again evident.

Table 4-85

Percent, Means and Standard Deviations for Environmental Attitudes

Items	Percent of respondents					Descriptive statistics	
	SD	MD	N	MA	SA	*M*	*SD*
1. We are approaching the limit of the number of people the earth cansupport	5.0	16.4	22.6	35.2	20.8	3.50	1.14
	2.3	7.3	22.6	35.6	32.2	3.88	1.02
2. Humans have the right to modify the natural environment to suit their needs	26.3	33.1	19.4	18.1	3.1	2.39	1.15
	12.4	22.6	28.2	29.9	6.8	2.96	1.14
3. When humans interfere with nature it often produces disastrous consequences	3.8	6.9	13.8	34.0	41.5	4.03	1.08
	3.4	0.5	24.3	32.2	31.6	3.80	1.08
4. Human ingenuity will insure that we do NOT make the earth unlivable	25.0	23.8	23.1	21.3	6.9	2.61	1.26
	7.3	25.4	32.2	25.4	9.6	3.05	1.09
5. Humans are severely abusing the environment	1.9	5.1	7.0	48.1	38.0	4.15	1.90
	3.4	10.2	23.7	44.6	18.1	3.64	1.00
6. The earth has plenty of natural resources if we just learn how to develop them	12.0	17.7	23.4	34.2	12.7	3.18	1.22
	18.6	24.9	20.3	21.5	14.7	2.89	1.34
7. Plants and animals have as much right as humans to exist	1.3	8.9	11.4	24.7	53.8	4.21	1.04
	1.7	8.0	18.8	34.7	36.9	3.97	1.02
8. The balance-of-nature is strong enough cope with the impacts of modern industrial nations	49.0	35.7	11.5	2.5	1.3	1.71	0.86
	31.8	44.3	14.8	0.1	4.0	2.05	1.02

(*Table continues*)

Table 4-85. (*continued*)

Items	Percent of respondents					Descriptive statistics	
	SD	MD	N	MA	SA	*M*	*SD*
9. Despite our special abilities humans are still subject to the laws of nature	0.6	5.7	8.2	28.3	57.2	4.36	0.90
	1.7	0.6	6.3	43.2	48.3	4.36	0.77
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated	33.8	30.6	19.7	12.7	3.2	2.21	1.14
	18.1	45.8	23.2	9.6	3.4	2.34	0.99
11. The earth is like a spaceship with very limited room and resources	5.7	13.9	23.4	29.7	27.2	3.59	1.19
	1.1	1.7	11.9	42.4	42.9	4.24	0.81
12. Humans were meant to rule over the rest of nature	36.9	27.4	15.3	16.6	3.8	2.23	1.22
	28.2	26.4	30.5	10.3	4.6	2.37	1.13
13. The balance-of-nature is very delicate and easily upset	1.9	7.6	9.6	34.4	46.5	4.16	1.01
	1.7	7.3	20.3	45.2	25.4	3.85	0.94
14. Humans will eventually learn enough about how nature works to be able to control it	26.1	38.2	15.9	16.6	3.2	2.32	1.13
	9.8	28.9	27.2	26.0	8.1	2.94	1.13
15. If things continue on their present course, we will soon experience a major ecological catastrophe	1.3	10.8	19.6	41.8	26.6	3.82	0.99
	2.3	4.0	29.1	39.4	25.1	3.81	0.94

*Note.*1. Participants were instructed: "Listed below are statements about the relationship between humans and the environment. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response." Items are measured using a 5-point scale (1 = strongly disagree (SD), 2 = mildly disagree (MD), 3 = neutral (N), 4 = mildly agree (MA), 5 = strongly agree (SA)). 2. Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items indicate pro-NEP responses. 3. Values in shaded boxes refer to Chinese respondents.

Factor Analysis

As discussed in the methods section, this study uses the revised New Environmental Paradigm (NEP) of 15 items to measure people's environmental attitudes. The NEP's 15 items were designed to assess five hypothesized dimensions of an ecological worldview: (a) the reality of limits to growth (i.e., items 1, 6, 11), (b) anti-anthropocentrism (i.e., items 2, 7, 12), the fragility of nature's balance (3, 8, 13), (c) rejection of exemptionalism (i.e., items 4, 9, 14), and (d) the possibility of an ecocrisis (i.e., items 5, 10, 15) (Dunlap et al., 2000). Agreement on the eight odd-numbered items and disagreement on the seven even-numbered items which were reverse worded indicate a proecological view (Dunlap et al., 2000).

Four factors with eigenvalues greater than one emerged from the principal-components analysis using varimax rotation (Table 4-86). These four factors explained, cumulatively, 53.0% of the variance. Six items load on the first factor: one limits item (item 1), three ecocrisis items (items 5, 10, 15), one balance-of-nature item (item 13), and one exemptionalism item (item 9). Four items load on the second factor, include the remaining two exemptionalism items (items 4, 14), the third balance item (item 8), and a limits item (item 6). The third factor includes three anti-anthropocentrism items (items 2, 7, 12), while the fourth factor includes two items: one limits item (item 11) and one balance-of-nature item (item 13). These four factors can be labeled as ecocrisis, limits to growth, anti-anthropocentrism, and balance-of-nature, respectively (see Table 4-87).

The four factors and their corresponding loading items are highly consistent with what Dunlap et al. (2000) found. In their study, the same four factors emerged using the same method, and the loaded items on each of the four factors are quite similar except items 1 and 13, which loaded on factor three and factor one in their study, respectively (versus the two items loading on factor one and factor three in this study). Generally, the high consistency between the two studies further endorses the validity of the use of the revised NEP.

Table 4-86

Principal Components Analysis (Using Varimax Rotation) of NEP Items

	Factor			
Category	1	2	3	4
Eigenvalue	3.91	1.68	1.33	1.05
Percent of variance	26.0	11.2	8.8	7.0
Cumulative percent	26.0	37.2	46.0	53.0
Items				
1. We are approaching the limit of the number of people theearth can support	**.53**	-.21	.03	.27
2. Humans have the right to modify the natural environmentto suit their needs	-.05	.21	**.75**	-.13
3. When humans interfere with nature it often produces disastrous consequences	**.79**	.02	-.16	-.16
4. Human ingenuity will insure that we do NOT make the earth unlivable	-.17	**.59**	.00	-.02
5. Humans are severely abusing the environment	**.67**	-.15	-.27	.12
6. The earth has plenty of natural resources if we just learn how to develop them	.07	**.78**	-.01	-.14

(*Table continues*)

Table 4-86. (*continued*)

Items	Factor 1	2	3	4
7. Plants and animals have as much right as humans to exist	.22	.16	**-.71**	.05
8. The balance-of-nature is strong enough cope with the impacts of modern industrial nations	-.16	**.62**	.17	-.14
9. Despite our special abilities humans are still subject to the laws of nature	**.52**	-.08	.05	.24
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated	**-.45**	.33	.12	-.32
11. The earth is like a spaceship with very limited room and resources	.23	-.17	-.06	**.70**
12. Humans were meant to rule over the rest of nature	-.04	.25	**.69**	-.11
13. The balance-of-nature is very delicate and easily upset	.15	.09	-.20	**.77**
14. Humans will eventually learn enough about how nature works to be able to control it	-.13	**.62**	.26	.24
15. If things continue on their present course, we will soon experience a major ecological catastrophe	**.61**	-.04	-.14	.44

Note: 1. Loadings of 0.45 and above are in bold. 2. Difference of 0.10 was used to separate the primary and secondary loadings.

Table 4-87 lists the four factors and their corresponding loading items, and the standardized Cronbach alpha for each scale for both ethnic groups. The table shows that the reliability values for these four factors range from .50 to .73 for Anglo-Canadians and .55 to .75 for Chinese, respectively. For Anglo-Canadians, the alpha for factor three is .56, however, the inter-item correlations range from .27 (only one item) to .43; thus this factor will be included in the further analysis. Similarly, for Chinese, the alpha for factor three is .58, however, the inter-item correlations range from .26 (only one item) to .49. This factor will therefore be included in further analysis. Both groups have low alphas for factor four, but the inter-item correlation for each group is high (.33 for Anglo-Canadians and .38 for Chinese). Moreover, this factor only includes two items. Therefore, this factor will be retained for further analysis.

Table 4-87

NEP Factor Loadings and Scale Cronbach's Coefficient Alphas

		a for standardized variables		
Factor (Proportion): Scale name & items	Loadings	Anglo-Canadians	Chinese	Comments
Factor 1: Ecocrisis (26.0%)		.61	.75	Item deletion not necessary
1. We are approaching the limit of the number of people the earth can support	.53			
3. When humans interfere with nature it often produces disastrous consequences	.79			

(*Table continues*)

Table 4-87. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables: Anglo-Canadians	*a* for standardized variables: Chinese	Comments
5. Humans are severely abusing the environment	.67			
9. Despite our special abilities humans are still subject to the laws of nature	.52			
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated	-.45			
15. If things continue on their present course, we will soon experience a major ecological catastrophe	.61			
Factor 2: Limits to growth (11.2%)		.56	.65	Item deletion not necessary
4. Human ingenuity will insure that we do NOT make the earth unlivable	.59			
6. The earth has plenty of natural resources if we just learn how to develop them	.78			
8. The balance-of-nature is strong enough cope with the impacts of modern industrial nations	.62			

(*Table continues*)

Table 4-87. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables Anglo-Canadians	 Chinese	Comments
14. Humans will eventually learn enough about how nature works to be able to control it	.62			
Factor 3: Anti-anthropocentrism (8.8%)		.73	.58	Item deletion not necessary
2. Humans have the right to modify the natural environment to suit their needs	.75			
7. Plants and animals have as much right as humans to exist	-.71			Item deletion not necessary
12. Humans were meant to rule over the rest of nature	.69			
Factor 4: Balance-of-nature (7.0%)		.50	.55	Item deletion not necessary
11. The earth is like a spaceship with very limited room and resources	.70			
13. The balance-of-nature is very delicate and easily upset	.77			

Hypothesis Test: Ethnicity

In order to test H10: There exist significant differences in attitudes toward the environment between Chinese in Canada and Anglo-Canadians, a MANCOVA was first performed on the four scales, and follow-up ANCOVAs were then performed.

As Table 4-88 illustrates, Anglo-Canadians had greater mean scores for scale 1, ecocrisis, and scale 2, limits to growth, and scale 3, anti-anthropocentrism than did Chinese, but they had less mean scores than the Chinese for scale 4, balance-of-nature. However, the difference in mean scores for scale 1 between thet two groups are very close. In contrast, the difference in mean scores for the remainder between the two groups are relatively greater. This indicates that both groups could exhibit no significant difference in attitudes toward ecocrisis, while they could be significantly different from each other in the other three scales--limits to growth, anti-anthropocentrism, and balance-of-nature.

Table 4-88

Descriptive Statistics for the Four Sub-Scales of Environmental Attitudes

Scale	Anglo-Canadians		Chinese	
	M	*SD*	*M*	*SD*
Ecocrisis	3.91	0.65	3.85	0.68
Limits to growth	3.55	0.74	3.27	0.83
Anti-anthropocentrism	3.88	0.88	3.53	0.79
Balance-of-nature	3.86	0.92	4.04	0.71

In order to statistically test the differences in the four scales between the two groups, a MANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 141$, Chinese, $n = 152$, and sex, females, $N = 131$, males, $N = 162$) and the three covariates was performed on the four scales. The Box's M test indicates that the assumption of homogeneity of variance-covariance across groups was not met, $F\,(30, 209258) = 2.02$, $p = .001$. However, the F value is small, suggesting the violation of the assumption is not a major concern (Rodgers, 2003). The assumption of homogeneity of regression slopes was met except for age, where the interaction effect between ethnicity and age was significant ($p < .05$) (Table 4-89). In addition, the interaction effect between education and age was significant ($p < .05$) while neither the interaction effect between income and age nor between income and education was significant (Table 4-90). The minor violation of homogeneity of regression slopes and the appropriateness of covariates did not pose a great influence when age was analyzed as a grouping factor. This is consistent with Glass et al. (1972) who argued that the violation of this assumption had very little effect upon the probability of a Type I error in an analysis of covariance. Therefore, for the parsimony of analysis, age was considered along with income and education as covariates. The results of the MANCOVA are presented in Table 4-91.

Table 4-89

Tests of Homogeneity of Regression for Environmental Attitudes

Source	Wilks' Λ	*F*	*df*	*p*
Ethnicity * Income	0.92	0.95	16, 563	.507
Ethnicity * Education	0.97	0.83	8, 368	.573
Ethnicity * Age	0.82	1.85*	20, 611	.014
Sex * Income	0.91	1.04	16, 526	.412
Sex * Education	0.94	1.41	8, 344	.190
Sex * Age	0.92	0.69	20, 571	.840

Note. Interactions were tested separately on ethnicity and sex; $^*p < .05$.

Table 4-90

Tests of the Appropriateness of the Three Independent Variables (i.e, Age, Education, and Income) as Covariates for Environmental Attitudes

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.83	1.13	48, 1061	.252
Income * Age	0.82	0.76	72, 1052	.931
Education * Age	0.77	1.41*	56, 1122	.026

Note. Interactions were tested separately on each pair; $^*p < .05$.

Table 4-91

Multivariate Analysis of Covariance for Environmental Attitudes

Effect	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	0.96	2.88*	4, 283	.023	.04	.78
Education	0.92	6.09**	4, 283	.000	.08	.99
Age	0.99	1.00	4, 283	.407	.01	.32
Ethnicity (E)	0.90	8.15**	4, 283	.000	.10	1.00
Sex (S)	0.98	1.61	4, 283	.172	.02	.49
E * S	0.98	1.82	4, 283	.125	.03	.55

Note. $^* p < .05$, $^{**}p < .001$.

After holding the demographic characteristics constant and considering the interaction between sex and ethnicity, Anglo-Canadians and Chinese did differ overall ? with regard to their attitudes toward the environment, Wilks' $\Lambda = 0.90$, $F(4, 283) = 8.15$, $p < .001$ (Table 4-91). It was estimated that 10% of the variance in the four scales can be attributed to ethnicity ($\eta_p^2 = .10$), and the probability of rejecting the false hypothesis is

1.00 ($\beta = 1.00$). In addition, the main effect of income was significant, Wilks' $\Lambda = 0.96$, F (4, 283) = 2.88, $p < .05$, and so was the main effect of education, Wilks' $\Lambda = 0.92$, F (4, 283) = 6.09, $p < .001$. However, the main effects of age and sex were not significant ($p > .05$) and nor was the interaction effect between ethnicity and sex ($p > .05$).

Follow-up ANCOVA was then performed separately on the four scales. For scale 1, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 145$, Chinese, $n = 156$, and sex, females, $N = 133$, males, $N = 168$) and the three covariates was computed. The results of this analysis are presented in Table 4-92. Levene's test of equality of error variances across groups was met for this scale, F (3, 297) = 0.19, $p > .05$.

Table 4-92

The Analysis of Covariance for Environmental Attitudes-Ecocrisis

Effect	MS	F	df	p	η_p^2	β
Income	3.21	7.59*	1, 294	.006	.03	.78
Education	3.35	7.90*	1, 294	.005	.03	.80
Age	1.22	2.89	1, 294	.090	.01	.40
Ethnicity (E)	1.29	3.04	1, 294	.082	.01	.41
Sex (S)	0.13	0.32	1, 294	.575	.00	.08
E * S	0.27	0.64	1, 294	.426	.00	.13

Note. Mean squares were calculated based on the Type III sum of squares; $^*p < .013$ (i.e., $p = .05/4$, where 4 refers to the number of sub-scales).

Table 4-92 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was not significant, F (1, 294) = 3.04, $p > .05$, suggesting that a significant difference did not exist between the two groups in attitudes toward ecocrisis. However, the main effect of income was significant at the adjusted Bonferroni level, $F\ (1, 294) = 7.59$, $p < .013$, and so was the main effect of education, $F\ (1, 294) = 7.90$, $p < .013$. Neither of the main effects for age and sex nor the interaction effect between ethnicity and sex was found to be significant ($p > .05$).

For scale 2, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 144$, Chinese, $n = 154$, and sex, females, $N = 134$, males, $N = 164$) and the three covariates was computed. The results of this analysis are presented in Table 4-93. Levene's test of equality of error variances across groups was met for this scale, $F\ (3, 294) = 2.13$, $p > .05$.

Table 4-93 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F\ (1, 291) = 17.28$, $p < .013$, the Bonferroni adjusted level. This indicates that there did exist significant difference between the two groups in attitudes toward limits to growth, and that Anglo-Canadians ($M = 3.55$, $SD = 0.74$) were more environmentally concerned than Chinese ($M = 3.27$, $SD = 0.83$) in this regard. In addition, the main effect of education was significant at the adjusted Bonferroni level, $F\ (1, 291) = 14.58$, $p < .013$. However, neither of the main effects for income, age and sex nor the interaction effect between ethnicity and sex was significant ($p > .05$).

Table 4-93

The Analysis of Covariance for Environmental Attitudes-Limits to growth

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.01	0.03	1, 291	.874	.000	.05
Education	8.60	14.58*	1, 291	.000	.048	.97
Age	0.12	0.20	1, 291	.652	.001	.07
Ethnicity (E)	10.19	17.28*	1, 291	.000	.056	.99
Sex (S)	0.45	0.77	1, 291	.382	.003	.14
E * S	0.82	1.40	1, 291	.238	.005	.22

Note. Mean squares were calculated based on the Type III sum of squares; $*p < .013$ (i.e., $p = .05/4$, where 4 refers to the number of sub-scales).

For scale 3, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 145$, Chinese, $n = 157$, and sex, females, $N = 133$, males, $N = 169$) and the three covariates was computed. The results of this analysis are presented in Table 4-94. Levene's test of equality of error variances across groups was met for this scale, $F(3, 298) = 0.19, p > .05$.

Table 4-94 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 295) = 9.21, p < .013$, at the Bonferroni adjusted level, suggesting that Anglo-Canadians ($M = 3.88$, $SD = 0.88$) were more environmentally concerned than Chinese ($M = 3.53$, $SD = 0.79$) with regard to anti-anthropocentrism. In addition, the main effect of sex was significant $F(1, 295) = 4.62, p < .05$, albeit not at the adjusted Bonferroni level, suggesting that females ($M = 3.83$, $SD = 0.84$) were more likely than males ($M = 3.58$, $SD = 0.85$) to endorse the anti-anthropocentrism. It should be noted that the interaction effect between ethnicity and sex was significant, $F\ (1, 295) = 5.60$, $p < .05$, albeit not at the Bonferroni adjusted level. The other main effects for age, education, and income were not significant ($p > .05$).

Table 4-94

Analysis of Covariance for Environmental Attitudes-Anti-Anthropocentrism

Effect	*MS*	*F*	*df*	*P*	η_p^2	β
Income	1.36	2.02	1, 295	.156	.01	.29
Education	0.76	1.14	1, 295	.288	.01	.19
Age	0.06	0.10	1, 295	.759	.00	.06
Ethnicity (E)	6.19	9.21**	1, 295	.003	.03	.86
Sex (S)	3.10	4.62*	1, 295	.032	.02	.57
E * S	3.76	5.60*	1, 295	.019	.02	.66

Note. Mean squares were calculated based on the Type III sum of squares; $^*p < .05$, $^{**}p < .013$ (i.e., $p = .05/4$, where 4 refers to the number of sub-scales).

Since there was an interaction effect between ethnicity and sex, although the effect was significant at the Bonferroni adjusted level, a further examination of the interaction effect would be appropriate. Table 4-95 presents the interaction means by Tukey's Honestly Significant Difference (HSD) procedure (cf. Lee, 1999). The results indicate that Anglo-Canadian females ($M = 4.13$, $SD = 0.82$) are significantly different from their male counterparts ($M = 3.64$, $SD = 0.89$) ($p < .01$), and from the Chinese females ($M = 3.54$, $SD = 0.76$) and males ($M = 3.53$, $SD = 0.81$). However, Anglo-Canadian males are not significantly different from either Chinese females or males and the Chinese females and males are not significantly different from each other ($p > .05$).

Table 4-95

Mean Differences for All Possible Paired Comparisons (diff(i - j) = row$_i$ - column$_j$))-Anti-Anthropocentrism

Ethnicity			Anglo-Canadians		Chinese	
	Sex		Females	Males	Females	Males
		Mean	4.13	3.64	3.54	3.53
Anglo-Canadians	Females	4.13		0.49*	0.59*	0.60*
	Males	3.64			0.10	0.11
Chinese	Females	3.54				0.01
	Males	3.53				

Note. *$p < .01$ using Tukey's HSD procedure.

For scale 4, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 145$, Chinese, $n = 159$, and sex, females, $N = 135$, males, $N = 169$) and the three covariates was computed. The results of this analysis are presented in Table 4-96. Levene's test of equality of error variances across groups was not met for this scale, $F(3, 300) = 4.39, p < .01$.

Table 4-96 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was not significant, $F(1, 297) = 2.67, p > .05$, suggesting that a significant difference did not exist between the two groups in attitudes toward the balance-of-nature. In addition, neither of the main effects with regard to income, education, age, and sex nor the interaction effect between ethnicity and sex was significant ($p > .05$).

Table 4-96

Analysis of Covariance for Environmental Attitudes-Balance-of-nature

Effect	*MS*	*F*	*df*	*P*	η_p^2	β
Income	0.07	0.10	1, 297	.755	.00	.06
Education	0.15	0.22	1, 297	.639	.00	.08
Age	0.78	1.16	1, 297	.282	.00	.19
Ethnicity (E)	1.80	2.67	1, 297	.103	.01	.37
Sex (S)	0.03	0.05	1, 297	.830	.00	.06
E * S	0.26	0.38	1, 297	.537	.00	.09

Note. Mean squares were calculated based on the Type III Sum of Squares.

Based on the above, **H10: There exist significant differences in attitudes toward the environment between Chinese in Canada and Anglo-Canadians** was supported overall by the MANCOVA but not by all four of the follow-up ANCOVAs. That is, the two groups did differ significantly in attitudes toward limits to growth and anti-anthropocentrism while they did not differ in attitudes toward ecocrisis and balance-of-nature. Specifically, Anglo-Canadians were more likely than Chinese to realize the limitation of human beings' abilities in developing and controlling the nature and to value the harmony of human beings with nature.

Hypothesis Test: Acculturation

In order to test H11: The more acculturated Chinese are, the more likely their environmental attitudes will be to those of Anglo-Canadians, a MANCOVA was first performed on the four scales, and follow-up pair comparisons were then tested.

Table 4-97 presents the means and standard deviations for the four sub-scales. The table shows that acculturation plays a role in affecting the Chinese respondents' attitudes toward limits to growth and anti-anthropocentrism, in that the there is a tendency that the means for the Chinese with high acculturation are close to the means for Anglo-Canadians with respect to these two scales. However, acculturation does not act as hypothesized for the other two scales, ecocrisis and balance-of-nature.

Table 4-97

Descriptive Statistics for Environmental Attitudes-Acculturation

			Chinese			
			High		Low	
	Anglo-Canadians		Acculturation		acculturation	
Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*
Ecocrisis	3.99	0.68	3.82	0.63	3.91	0.73
Limits to growth	3.55	0.74	3.35	0.82	3.09	0.87
Anti-anthropocentrism	3.88	0.88	3.63	0.71	3.49	0.82
Balance-of-nature	3.86	0.92	4.03	0.69	4.03	0.75

In order to statistically test the differences in the four scales among the three groups, a MANCOVA with two grouping factors (i.e., acculturation, Anglo-Canadians, $n = 141$, Chinese with high acculturation, $n = 51$, and Chinese with low acculturation, $n = 51$; and sex, female, $N = 108$, male, $N = 135$) and three covariates (i.e., age, education, and income) was performed on the four dependent variables (i.e., the four scales). The Box's M test indicates that the homogeneity of variance-covariance was not met, F (50, 31410) = 1.92, $p < .001$. However, the departures from homogeneity of variance-covariance are only minor or inconsequential taking into account the small F value (Rodgers, 2003). The assumption of homogeneity of regression slopes was met for all three covariates, suggesting the use of MANCOVA is feasible (Table 4-98). In addition, none of the interaction effects between each pair of the three covariates was significant ($p > .05$), indicating that the inclusion of the three variables as covariates is appropriate (Table 4-99). The results of the MANCOVA are presented in Table 4-100.

Table 4-98

Tests of Homogeneity of Regression for Environmental Attitudes-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*
Acculturation * Income	0.77	1.08	32, 456	.355
Acculturation * Education	0.88	1.03	16, 379	.427
Acculturation * Age	0.77	0.95	36, 466	.563
Sex * Income	0.92	0.70	16, 392	.798
Sex * Education	0.89	1.85	8, 256	.069
Sex * Age	0.88	0.85	20, 425	.656

Note. Interactions were tested separately on acculturation and sex.

Table 4-99

Tests of Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for Environmental Attitudes-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.77	1.25	48, 869	.125
Income * Age	0.78	0.77	72, 856	.917
Education * Age	0.74	1.32	56, 912	.062

Note. Interactions were tested separately on each pair.

Table 4-100

Multivariate Analysis of Covariance for Environmental Attitudes-Acculturation

Effect	Wilks' Λ	F	df	p	η_p^2	β
Income	0.97	1.78	4, 231	.134	.03	.54
Education	0.91	5.43*	4, 231	.000	.09	.97
Age	0.99	0.82	4, 231	.513	.01	.26
Acculturation (A)	0.86	4.45*	8, 462	.000	.07	1.00
Sex (S)	0.99	0.85	4, 231	.493	.01	.27
A * S	0.97	0.92	8, 462	.497	.02	.43

Note. * $p < .001$.

After holding the demographic characteristics constant and considering the interaction between acculturation and sex, the three groups did differ overall in regard to their environmental attitudes, Wilks' Λ = 0.86, $F\,(8, 462) = 4.45$, $p < .001$ (Table 4-100). It was estimated that 7% of the variance in the four dependent variables can be attributed to group membership ($\eta_p^2 = .07$), and probability of rejecting the null hypothesis when it is false is 1.00 ($\beta = 1.00$). It should be noted that the main effect of education was significant, Wilks' Λ = 0.91, $F\,(4, 231) = 5.43$, $p < .001$. It was estimated that 9% of the variance in the four dependent variables can be attributed to education ($\eta_p^2 = .09$), and the probability of rejecting the null hypothesis when it is false is .97 ($\beta = .97$). However, neither of the main effects with regards to income, age and sex nor the interaction effect between group membership and sex was significant ($p > .05$).

The analysis implies that significant differences in environmental attitudes did exist among the three groups. Significant simple main effect of group membership was further analyzed by pairwise comparisons using the Bonferroni adjustment for multiple comparisons. Table 4-101 presents the results of this analysis for estimated marginal means. The pairwise comparisons are presented in Table 4-102.

Table 4-101

Estimated Marginal Means for Environmental Attitudes

Dependent Variable	Groups	*M*	*SE*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Scale 1	Anglo-Canadians	4.02	0.06	3.91	4.14
	High acculturation	3.79	0.10	3.59	4.00
	Low acculturation	3.85	0.10	3.66	4.05
Scale 2	Anglo-Canadians	3.63	0.07	3.49	3.76
	High acculturation	3.16	0.12	2.93	3.39
	Low acculturation	3.02	0.11	2.80	3.25
Scale 3	Anglo-Canadians	3.90	0.07	3.75	4.04
	High acculturation	3.66	0.13	3.41	3.91
	Low acculturation	3.43	0.12	3.20	3.67
Scale 4	Anglo-Canadians	3.85	0.08	3.70	4.00
	High acculturation	4.06	0.13	3.80	4.32
	Low acculturation	4.04	0.13	3.79	4.29

Note. Means evaluated at covariates appeared in the model: Income = 2.77, Education = 2.85, Age = 2.91.

Table 4-102

Pairwise Comparisons for Environmental Attitudes

Dependent variables	Groups		Mean difference (I – J)	*SE*	*p*	95% Confidence Interval	
	I	J				Lower Bound	Upper Bound
Scale 1	High acculturation	Low acculturation	-0.06	0.14	1.000	-0.40	0.28
		Anglo-Canadians	-0.23	0.13	.204	-0.53	0.07
	Low acculturation	Anglo-Canadians	-0.17	0.12	.484	-0.46	0.12
Scale 2	High acculturation	Low acculturation	0.14	0.16	1.000	-0.24	0.52
		Anglo-Canadians	-0.47*	0.14	.004	-0.81	-0.12
	Low acculturation	Anglo-Canadians	-.60*	0.14	.000	-0.93	-0.27
Scale 3	High acculturation	Low acculturation	0.23	0.17	.536	-0.18	0.63
		Anglo-Canadians	-0.24	0.15	.358	-0.60	0.13
	Low acculturation	Anglo-Canadians	-0.46*	0.15	.005	-0.81	-0.11
Scale 4	High acculturation	Low acculturation	0.02	0.18	1.000	-0.40	0.45
		Anglo-Canadians	0.21	0.16	.545	-0.17	0.59
	Low acculturation	Anglo-Canadians	0.19	0.15	.634	-0.18	0.56

Note. The multiple comparisons based on estimated marginal means with adjustment Bonferroni; *$p < .001$.

Table 4-102 illustrates that there were no significant differences in attitudes toward scale 1, ecocrisis, and scale 4, balance-of-nature, among the three groups, while in terms of scale 2, attitudes toward limits to growth, Anglo-Canadians (*M* = 3.63; *SE* = 0.07) were significantly different from the Chinese with high acculturation (*M* = 3.16, *SE* = 0.12) (*p* < .001), at the Bonferroni adjusted level, and from the Chinese with low acculturation (*M* = 3.02, *SE* = 0.11) (*p* < .001), at the Bonferroni adjusted level, too, while the two Chinese groups were not significantly different from each other (*p* > .05). In terms of scale 3, anti-anthropocentrism, the Chinese with high acculturation (*M* = 3.66, *SE* = 0.13) were not significantly different from Anglo-Canadians (*M* = 3.90, *SE* = 0.07), and from the Chinese with low acculturation (*M* = 3.43, *SE* = 0.12), while the latter two groups were significantly different from each other (*p* < .001), at the Bonferroni adjusted level.

Based on the above, **H11: The more acculturated Chinese are, the more likely their environmental attitudes will be similar to those of Anglo-Canadians** was partially supported, where the more acculturated Chinese are, the more likely their environmental attitudes with respect to anti-anthropocentrism will be to those of Anglo-Canadians. Nonetheless, acculturation did not play a role in changing the Chinese respondents' attitudes toward ecocrisis, limits to growth, and balance-of-nature.

Within Group Issues

In order to examine the relationships between environmental values and the NEP, a zero-order Pearson correlation analysis was separately conducted among Anglo-Canadians and the Chinese. The results are reported in Table 4-103 and Table 4-104. In addition, regression analyses were conducted to examine the relationships to environmental values and the NEP to socio-demographic variables.

Table 4-103

Zero-Order Pearson Correlation Coefficients between Environmental Value Sub-Scales and the NEP Sub-Scales for Anglo-Canadians (Maximum N = 157)

	Ecocrisis	Limits to growth	Anti-anthropocentrism	Balance-of-nature
Social-altruistic	.15	.01	.13	.13
values	(.07)	(.96)	(.12)	(.12)
Biospheric values	.26*	.05	.37*	.32*
	(.001)	(.54)	(.000)	(.000)

Note. Values in parentheses refer to *p* values; * $p < .001$.

Table 4-104

Zero-Order Pearson Correlation Coefficients between Environmental Value Sub-Scales and the NEP Sub-Scales for Chinese (Maximum N = 177)

	Ecocrisis	Limits to growth	Anti-anthropocentrism	Balance-of-nature
Social-altruistic	.09	-.04	.08	.14
values	(.24)	(.58)	(.29)	(.06)
Biospheric values	.29*	.07	.21*	.27*
	(.000)	(.38)	(.006)	(.000)

Note. Values in parentheses refer to *p* values; *$p < .001$.

Anglo-Canadians. Among Anglo-Canadians, social-altruistic values were not significantly related to any of the four scales of the NEP. However, biospheric values were found to be significantly and positively related to three NEP scales--ecocrisis ($r = .26, p = .001, N = 145$), anti-anthropocentrism ($r = .34, p < .001, N = 144$), and balance-of-nature ($r = .32, p < .001, N = 146$).

Separate multiple regression analyses of environmental values and the NEP on sex, age, education, and income indicated that age, education, and income were not significantly related to any environmental value scales and the NEP sub-scales while sex was significantly related to the two environmental value scales ($p < .01$) and one NEP scale, anti-anthropocentrism ($p < .01$), with females being more environmentally concerned than males.

Chinese. Chinese respondents exhibited exactly the same pattern of relationship between environmental values and the NEP as Anglo-Canadians. For the Chinese, social-altruistic values were not significantly related to any of the four sub-scales of the NEP, while biospheric values were significantly and positively related to three NEP sub-scales--ecocrisis ($r = .29, p < .001, N = 174$), anti-anthropocentrism ($r = .21, p < .001, N = 174$), and balance-of-nature ($r = .27, p < .001, N = 177$).

The two environmental value scales and four NEP sub-scales were separately regressed on sex, age, education, income, and acculturation. The results indicated that age, education, and income, and acculturation were not significantly related to either environmental value sub-scales ($p > .05$) while sex was the only variable that was significantly related to social-altruistic values ($p < .01$) with females being more altruistic than males. In the case of the NEP, two sub-scales, ecocrisis and balance-of-nature, were not significantly related to any of the five variables ($p > .05$). However, education was found to be the single variable that was significantly related to the second sub-scale, limits to growth ($p < .01$). That is, Chinese individuals with higher levels of education were more supportive of limits to growth than those Chinese with lower levels of education. Sex, age, education, and income were not significantly related to the remainders--anti-anthropocentrism. However, the effect of acculturation was significant ($p < .05$) on anti-anthropocentrism, with those who were high acculturated endorsed the anti-anthropocentrism more than did those who were low acculturated.

Conclusion

This sub-section discussed the frequency distribution with regard to each item measuring environmental values and attitudes between the two groups-Anglo-Canadians and Chinese; conducted culture-free factor analyses on each of the two measures regarding environmental values and attitudes, respectively; and tested two hypotheses on ethnicity and three on acculturation.

The results indicate:

1. Similar to the response patterns regarding the three aspects of national parks, the response patterns for the two groups in a large number of items measuring environmental values and attitudes were similar. That is, those items that were responded by a majority/minority of Anglo-Canadians were also responded by a majority/minority of Chinese. However, the phenomenon that Chinese respondents were more likely to choose the middle ones and less likely to choose the extremes along a spectrum of choices, as exhibited in attitudes toward national parks, was not repeated with respect to environmental values, particularly altruism, while it did repeat with respect to environmental attitudes. One explanation could be that values are less changeable and relatively stable and abstract in comparison with attitudes. Therefore, people tend to

converge in values while diverging in attitudes. This can be reflected by the similarity index (see Appendix G) (at the 95% level of similarity), which is 3.3 for environmental values and 2.27 for environmental attitudes, respectively, where the former is higher than the latter.

2. The two measures were not unidimensional with the measure involving environmental values having two dimensions, and the measure involving environmental attitudes four dimensions, respectively.

3. Although the two groups did differ overall in environmental values and attitudes, this pattern did not apply to all of the dimensions. Specifically, in terms of environmental values, the Chinese respondents were significantly different in altruism from Anglo-Canadians, with the Chinese putting greater emphasis on altruism than Anglo-Canadians, while the two groups did not differ in the biospheric value orientation. In terms of environmental attitudes, the two groups did not differ in ecocrisis and balance-of-nature while they did differ with reference to the limits to growth and anti-anthropocentrism. Anglo-Canadians were more likely than Chinese to realize the limitation of human beings' abilities in developing and controlling the nature and to value the harmony of human beings with nature. In addition, females were more environmentally concerned than males.

4. The hypotheses on acculturation were partially supported, where the more acculturated Chinese are, the more similar their environmental values on altruism and their environmental attitudes with respect to anti-anthropocentrism will be to those of Anglo-Canadians. However, acculturation did not play a part in changing Chinese people's environmental values on protection and attitudes toward ecocrisis, limits to

growth, and balance-of-nature. In addition, although visually, the less acculturated a Chinese, the higher retention of his or her traditional values, the differences were not statistically significant.

5. Similar to findings with regard to attitudes toward national parks, it appeared that environmental values and attitudes were less likely to be related to age, education, and income. This is particularly true for Anglo-Canadians. Relatively speaking, sex was an important factor.

6. Biospheric values were significantly related to the NEP while social-altruistic values were not.

Leisure

This sub-section presents the findings on respondents' attitudes of the two groups toward leisure. Descriptive statistics, factor analysis, MANCOVAs and ANCOVAs are presented. Three hypotheses are tested in this sub-section.

Descriptive Statistics

The two groups' responses in regard to attitudes toward leisure are presented in Table 4-105. Of the 24 items, the majority of them (21 items) had the highest frequency of responses in either the "mildly agree" or "strongly agree" category, indicating that both groups hold positive attitudes toward leisure. The top three responses in the category of "strongly agree" for Anglo-Canadians are: item 2 "leisure pursuits contribute to one's health" (73.4%), item 9 "my leisure pursuits give me pleasure" (73.0%), and item 8 "People need leisure pursuits" (70.3%). For Anglo-Canadians, the highest mean value was 4.69 of 5 for item 9. For the Chinese group, the top three responses are: item 8 (66.9%), item 2 (66.3%), and item 3 (i.e., "leisure pursuits increase one's happiness"). The highest mean value for this group was 4.65 for item 2.

Only one item, namely item 11 "I feel guilty about enjoying myself" (59.7% for Anglo-Canadians and 30.9% for Chinese) was "strongly disagreed" by both groups. Combining this category with the "mildly disagree" category, 82.3% of Anglo-Canadians and 72.5% of Chinese disagreed with this item. This item also had the lowest mean for both groups, with 1.70 and 2.02 for Anglo-Canadians and Chinese, respectively, indicating that Chinese is more likely to feel guilty about enjoying themselves than Anglo-Canadians.

Table 4-105

Percent, Means and Standard Deviations for Leisure Attitudes

	Percent of respondents					Descriptive statistics	
Items	SD	MD	N	MA	SA	*M*	*SD*
1. Leisure pursuits are beneficial to	0.0	0.0	3.8	31.6	64.6	4.61	0.56
individuals and society	0.0	0.6	5.6	49.7	44.1	4.37	0.62
2. Leisure pursuits contribute to	0.6	0.0	3.2	22.8	73.4	4.68	0.60
one's health	0.0	0.0	1.7	32.0	66.3	4.65	0.51
3. Leisure pursuits increase one's	0.6	1.3	3.8	29.1	65.2	4.57	0.69
happiness	0.0	0.6	6.2	39.9	53.4	4.46	0.64
4. Leisure increases one's work	0.6	0.0	7.0	37.3	55.1	4.46	0.68
productivity	0.0	1.1	11.8	42.1	44.9	4.31	0.72
5. Leisure pursuits help to renew	0.6	0.0	1.9	34.6	62.9	4.59	0.60
one's energy	0.0	0.0	3.4	46.3	50.3	4.47	0.56
6. Leisure pursuits can be a means	0.6	0.6	1.9	35.4	61.4	4.56	0.63
for self-improvement	1.7	5.1	29.8	41.0	22.5	3.78	0.91

(*Table continues*)

Table 4-105. (*continued*)

Items	Percent of respondents					Descriptive statistics	
	SD	MD	N	MA	SA	*M*	*SD*
7. Leisure pursuits help individuals to relax	0.0	0.0	1.9	32.3	65.8	4.64	0.52
	0.0	1.1	2.2	37.1	59.6	4.55	0.60
8. People need leisure pursuits	0.6	0.0	2.5	26.6	70.3	4.66	0.59
	0.0	0.0	2.8	30.3	66.9	4.64	0.54
9. My leisure pursuits give me pleasure	0.6	0.0	1.9	24.5	73.0	4.69	0.57
	0.0	0.6	2.2	38.2	59.0	4.56	0.57
10. My leisure pursuits are exciting	1.3	1.3	18.2	46.5	32.7	4.08	0.82
	0.6	3.9	28.1	39.9	27.5	3.90	0.87
11. I feel guilty about enjoying myself	59.7	22.6	8.2	6.9	2.5	1.70	1.05
	30.9	41.6	22.5	4.5	0.6	2.02	0.88
12. I can be myself during my leisure	0.6	1.9	8.4	40.0	49.0	4.35	0.77
	0.6	6.2	48.9	28.1	16.3	3.53	0.86
13. My leisure pursuits are interesting	0.0	1.3	11.4	39.9	47.5	4.34	0.73
	0.0	2.2	22.5	50.6	24.7	3.98	0.75
14. My leisure pursuits are refreshing	0.0	0.0	8.2	45.9	45.9	4.38	0.63
	0.0	1.7	20.2	48.3	29.8	4.06	0.75
15. I like my leisure pursuits	0.0	0.6	2.5	34.6	62.3	4.58	0.58
	0.0	0.6	11.2	50.6	37.6	4.25	0.67
16. My leisure pursuits absorb or get my full attention	3.2	17.1	17.7	38.6	23.4	3.62	1.12
	0.0	5.1	31.1	42.4	21.5	3.80	0.83

(*Table continues*)

Table 4-105. (*continued*)

Items	Percent of respondents					Descriptive statistics	
	SD	MD	N	MA	SA	*M*	*SD*
17. I buy goods and equipment to use in my leisure pursuits as my income allows	1.3	5.0	18.2	49.7	25.8	3.94	0.87
	1.1	6.7	21.9	43.3	27.0	3.88	0.92
18. I spend considerable time and effort to be more competent in my leisure pursuits	5.7	23.3	32.1	27.0	11.9	3.16	1.09
	2.3	30.5	49.2	13.0	5.1	2.88	0.85
19. Given a choice I would live in an environment or city which provides or leisure	0.6	3.8	12.7	34.2	48.7	4.27	0.87
	0.0	3.9	13.5	46.1	36.5	4.15	0.80
20. I would attend a seminar or a class to be able to do leisure pursuits better	1.9	12.7	28.7	39.5	17.2	3.57	0.98
	5.6	14.0	40.4	30.3	9.6	3.24	1.00
21. I support the idea of increasing my free time to engage in leisure pursuits	0.0	7.6	25.3	39.9	27.2	3.87	0.90
	1.1	5.1	29.2	40.4	24.2	3.81	0.90
22. I engage in leisure pursuits even when I am busy	3.8	27.0	22.0	33.3	13.8	3.26	1.12
	2.8	5.3	29.9	39.0	13.0	3.44	0.99
23. I would spend time in education and preparation for leisure pursuits	2.5	13.8	34.6	37.1	11.9	3.42	0.96
	3.4	15.2	36.5	34.8	10.1	3.33	0.97
24. I give my leisure high priority among other pursuits	7.6	22.2	26.6	27.8	15.8	3.22	1.18
	6.2	22.6	49.7	15.3	6.2	2.93	0.94

Note. 1. Participants were instructed: "Listed below are statements about your attitudes toward leisure. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response." Items are measured using a 5-point scale (1 = strongly disagree (SD), 2 = mildly agree (MD), 3 = neutral (N), 4 = mildly agree (MA), 5 = strongly agree (SD)). 2. Values in the shaded boxes refer to Chinese respondents.

Factor Analysis

Leisure attitudes in this study were measured by using a modified Leisure Attitude Scale developed by Ragheb and Beard (1982). The original measurement includes 36 items which examine three hypothesized dimensions of leisure attitudes: cognitive, affective, and behavioral (12 items per dimension). The 24 items used in this study include 23 items from the Leisure Attitude Scale and one (item 11) from Crandall and Slivken's (1980) Leisure Ethic Scale, with 8 items measuring each of the three leisure attitude dimensions.

Table 4-106 lists the results of factor analysis of the leisure attitude items using principal components analysis with varimax rotation. Four factors were found with eigenvalues greater than one. These four factors explained, cumulatively, 57.7% of the variance. Eight items loaded on factor one: seven from the cognitive dimension (i.e., items 1, 2, 3, 4, 5, 7, 8) and one from the affective dimension (item 9). Six behavioral items loaded on factor two (i.e., items 19, 20, 21, 22, 23, 24), six affective items loaded on factor three (i.e., items 10, 12, 13, 14, 15,16), and one affective item loaded on factor four (item 11). Three items--one cognitive item (item 6) and two behavioral items (items 17, 18)--did not load on any of the four factors.

Generally, the factors and their corresponding loading items, except item for 11, were highly consistent with what was found in Ragheb and Beard's (1982) study. As factor four only has one item, this factor will be excluded from further analysis. Therefore, three factors were found which can be labeled as cognitive, affective, and behavioral aspects of leisure attitudes, respectively (see Table 4-107).

Table 4-106

Principal Components Analysis (Using Varimax Rotation) of Leisure Attitude Items

Category	Factor			
	1	2	3	4
Eigenvalue	8.67	2.69	1.38	1.13
Percent of variance	36.1	11.2	5.7	4.7
Cumulative percent	36.1	47.3	53.0	57.7
Items				
1. Leisure pursuits are beneficial to individuals and society	**.72**	.28	.09	.13
2. Leisure pursuits contribute to one's health	**.77**	.16	.12	.13
3. Leisure pursuits increase one's happiness	**.81**	.18	.18	-.03
4. Leisure increases one's work productivity	**.75**	.13	.25	-.17
5. Leisure pursuits help to renew one's energy	**.74**	.08	.25	-.09
6. Leisure pursuits can be a means for self-improvement	**.48**	.13	.32	-.47
7. Leisure pursuits help individuals to relax	**.74**	.04	.21	.08
8. People need leisure pursuits	**.77**	.13	.11	.08
9. My leisure pursuits give me pleasure	**.74**	.04	.27	.12
10. My leisure pursuits are exciting	.35	.09	**.60**	-.17
11. I feel guilty about enjoying myself	-.11	-.05	-.13	**-.60**
12. I can be myself during my leisure	.22	.16	**.64**	-.18
13. My leisure pursuits are interesting	.28	.26	**.68**	.27

(*Table continues*)

Table 4-106. (*continued*)

Items	Factor 1	2	3	4
14. My leisure pursuits are refreshing	.33	.14	**.70**	.22
15. I like my leisure pursuits	.44	.14	**.56**	.33
16. My leisure pursuits absorb or get my full attention	.13	.37	**.57**	.11
17. I buy goods and equipment to use in my leisure pursuits as my income allows	.13	.43	.50	.15
18. I spend considerable time and effort to be more competent in my leisure pursuits	-.02	.53	.47	-.16
19. Given a choice I would live in an environment or city which provides for leisure	.26	**.48**	.25	.08
20. I would attend a seminar or a class to be able to do leisure pursuits better	.06	**.75**	.08	-.20
21. I support the idea of increasing my free time to engage in leisure pursuits	.28	**.63**	.14	.01
22. I engage in leisure pursuits even when I am busy	.11	**.66**	.14	.34
23. I would spend time in education and preparation for leisure pursuits	.12	**.81**	.09	-.02
24. I give my leisure high priority among other pursuits	.07	**.66**	.22	.09

Note: 1. Loadings of 0.45 and above are in bold. 2. Difference of 0.10 was used to separate the primary and secondary loadings.

Table 4-107 lists the three usable factors and their corresponding loading items, and the standardized Cronbach alpha for each scale for both ethnic groups. The table shows that these three factors have satisfactory reliability values, ranging from .77 to .93 for Anglo-Canadians and .82 to .90 for Chinese.

Table 4-107

Leisure Attitude Factor Loadings and Scale Cronbach's Coefficient Alphas

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables Anglo-Canadians	Chinese	Comments
Factor 1: Cognitive (36.1%)		.93	.90	Item deletion not necessary
1. Leisure pursuits are beneficial to individuals and society	.72			
2. Leisure pursuits contribute to one's health	.77			
3. Leisure pursuits increase one's happiness	.81			
4. Leisure increases one's work productivity	.75			
5. Leisure pursuits help to renew one's energy	.74			
7. Leisure pursuits help individuals to relax	.74			

(*Table continues*)

Table 4-107. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables Anglo-Canadians	 Chinese	Comments
8. People need leisure pursuits	.77			
9. My leisure pursuits give me pleasure	.74			
Factor 2: Behavioral (11.2%)		.80	.86	Item deletion not necessary
19. Given a choice I would live in an environment or city which provides for leisure	.48			
20. I would attend a seminar or a class to be able to do leisure pursuits better	.75			
21. I support the idea of increasing my free time to engage in leisure pursuits	.63			
22. I engage in leisure pursuits even when I am busy	66			
23. I would spend time in education and preparation for leisure pursuits	.81			

(*Table continues*)

Table 4-107. (*continued*)

Factor (Proportion): Scale name & items	Loadings	*a* for standardized variables Anglo-Canadians	 Chinese	Comments
24. I give my leisure high priority among other pursuits	.66			
Factor 3: Affective (5.7%)		.77	.82	Item deletion not necessary
10. My leisure pursuits are exciting	.60			
12. I can be myself during my leisure	.64			
13. My leisure pursuits are interesting	.68			
14. My leisure pursuits are refreshing	.70			
15. I like my leisure pursuits	.56			
16. My leisure pursuits absorb or get my full attention	.57			

Hypothesis Test: Ethnicity

In order to test H12: There exist significant differences in leisure attitudes between Chinese in Canada and Anglo-Canadians, a MANCOVA was first performed on the three scales, and follow-up ANCOVAs were then performed.

As noted in Table 4-108, Anglo-Canadians had greater mean scores for all the three dimensions of leisure attitudes than had Chinese. Both groups had the highest mean score on the scale 1, cognitive dimension, with 4.64 for the former and 4.50 for the latter. Likewise, both groups had the lowest mean on scale 2, the behavioral dimension, with 3.65 for the former and 3.48 for the latter.

Table 4-108

Descriptive Statistics for the Three Sub-Scales of Leisure Attitudes

Scale	Anglo-Canadians		Chinese	
	M	*SD*	*M*	*SD*
Cognitive	4.64	0.44	4.50	0.47
Behavioral	3.65	0.68	3.48	0.68
Affective	4.25	0.52	3.92	0.61

A MANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 138$, Chinese, $n = 157$, and sex, females, $N = 132$, males, $N = 163$) and the three covariates was performed on the three scales. The Box's M test indicated that the assumption of homogeneity of variance-covariance across groups was met, F (18, 265212) = 0.56, $p > .05$. Additionally, The assumption of homogeneity of regression slopes was met except for the variable, income, where the interaction effect between ethnicity and income was significant ($p < .05$) (Table 4-109). However, none of the interaction effects between each pair of the three independent variables, income, education, and age, was significant ($p > .05$), suggesting that the inclusion of the three variables as covariates was appropriate (Table 4-110). The minor violation of homogeneity of regression slopes did not greatly influence when income was analyzed as a grouping factor. This is consistent with what Glass et al. (1972) argued that the violation of this assumption had very little effect upon the probability of a Type I error in an analysis of covariance. Therefore, for the parsimony of analysis, income was considered along with education and age as covariates. The results of the MANCOVA are presented in Table 4-111.

Table 4-109

Tests of Homogeneity of Regression for Leisure Attitudes

Source	Wilks' Λ	*F*	*df*	*p*
Ethnicity * Income	0.88	2.09*	12, 495	.017
Ethnicity * Education	0.96	1.14	6, 374	.337
Ethnicity * Age	0.92	1.01	15, 517	.441
Sex * Income	0.96	0.62	12, 469	.830
Sex * Education	0.96	1.09	6, 354	.369
Sex * Age	0.93	0.91	15, 489	.559

Note. Interactions were separately tested on ethnicity and sex; $*p < .05$.

Table 4-110

Tests of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for Leisure Attitudes

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.92	0.71	33, 819	.886
Income * Age	0.85	0.82	54, 802	.819
Education * Age	0.88	0.92	42, 864	.616

Note. Interactions were separately tested on each pair.

Table 4-111

Multivariate Analysis of Covariance for Leisure Attitudes

Effect	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	1.00	0.37	3, 286	.771	.00	.12
Education	0.95	4.51*	3, 286	.004	.05	.88
Age	0.99	0.61	3, 286	.611	.01	.18
Ethnicity (E)	0.95	4.84*	3, 286	.003	.05	.90
Sex (S)	1.00	0.19	3, 286	.901	.00	.09
E * S	0.98	2.03	3, 286	.110	.02	.52

Note. *$p < .001$.

As Table 4-111 illustrates, after holding the demographic characteristics constant and considering the interaction between sex and ethnicity, Anglo-Canadians and Chinese did differ overall in regard to their attitudes toward leisure, Wilks' Λ = 0.95, $F(3, 286) = 4.84$, $p < .001$. It was estimated that 5% of the variability in the three sub-scales can be attributed to ethnicity ($\eta_p^2 = .05$), while the probability of rejecting the false hypothesis is .90 ($\beta = .90$). It should be noted that the main effect of education overall was significant ($p < .001$). However, neither of the main effects of income, age, and sex nor the interaction effect between ethnicity and sex was significant ($p > .05$).

Follow-up ANCOVA was then performed separately on the three sub-scales. For scale 1, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, n = 144, Chinese, n = 158, and sex, females, N = 134, males, N = 168) and the three covariates was computed. The results of this analysis are presented in Table 4-112. Levene's test of equality of error variances across groups was met for this factor, $F(3, 298) = 0.90$, $p > .05$.

Table 4-112

Analysis of Covariance for Leisure Attitudes-Cognitive

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.00	0.02	1, 295	.896	.00	.05
Education	0.05	0.24	1, 295	.624	.00	.08
Age	0.29	1.42	1, 295	.235	.00	.22
Ethnicity (E)	1.37	6.72*	1, 295	.010	.02	.73
Sex (S)	0.00	0.00	1, 295	.983	.00	.05
E * S	0.47	2.31	1, 295	.130	.01	.33

Note. Mean squares were calculated based on the Type III sum of squares; $^*p < .017$ (i.e., $p = .05/3$, where 3 refers to the number of sub-scales).

Table 4-112 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 295) = 6.72$, $p < .017$, at the Bonferroni adjusted level. This finding indicates that a significant difference did exist between the two groups in the cognitive dimension of leisure attitudes, and that Anglo-Canadians ($M = 4.64$, $SD = 0.44$) valued the cognitive dimension of leisure attitudes more than did Chinese ($M = 4.50$, $SD = 0.47$). However, neither of the other main effects for income, education, age, and sex nor the interaction effect between ethnicity and sex was significant ($p > .05$).

For scale 2, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 143$, Chinese, $n = 158$, and sex, females, $N = 134$, males, $N = 167$) and the three covariates was computed and the results are presented in Table 4-113. Levene's test of equality of error variances across groups was met for this scale, $F(3, 297) = 0.10$, $p > .05$.

Table 4-113

Analysis of Covariance for Leisure Attitudes-Behavioral

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.50	1.10	1, 294	.294	.00	.18
Education	0.38	0.82	1, 294	.366	.00	.15
Age	0.01	0.01	1, 294	.907	.00	.05
Ethnicity (E)	1.72	3.75	1, 294	.054	.01	.49
Sex (S)	0.18	0.40	1, 294	.527	.00	.10
E * S	1.01	2.21	1, 294	.138	.01	.32

Note. Mean squares were calculated based on the Type III sum of squares.

Table 4-113 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was marginally significant, *F* (1, 294) = 3.75, $p = .054$, albeit not at the Bonferroni adjusted level, suggesting there could exist a significant difference between both groups in the behavioral dimension of leisure attitudes, and that Anglo-Canadians (*M* = 3.65, *SD* = 0.68) could value the behavioral dimension of leisure attitudes more than did Chinese (*M* = 3.48, *SD* = 0.68). However, all of the other main effects and the interaction effect between ethnicity and sex were not significant ($p > .05$).

For scale 3, an ANCOVA with two grouping factors (i.e., ethnicity, Anglo-Canadians, $n = 142$, Chinese, $n = 160$, and sex, females, $N = 135$, males, $N = 167$) and the three covariates was computed and the results are presented in Table 4-114. Levene's test of equality of error variances across groups was met for this scale, *F* (3, 298) = 0.31, $p > .05$.

Table 4-114

Analysis of Covariance for Leisure Attitudes-Affective

Effect	*MS*	*F*	*df*	*p*	η_p^2	β
Income	0.04	0.13	1, 295	.722	.00	.06
Education	1.07	3.46	1, 295	.064	.01	.46
Age	0.09	0.30	1, 295	.585	.00	.08
Ethnicity (E)	3.91	12.60*	1, 295	.000	.04	.94
Sex (S)	0.08	0.25	1, 295	.619	.00	.08
E * S	0.00	0.00	1, 295	.985	.00	.05

Note. Mean squares were calculated based on the Type III sum of squares; $^*p < .017$ (i.e., $p = .05/3$, where 3 refers to the number of sub-scales).

Table 4-114 indicates that after holding income, education, and age constant and considering the interaction between ethnicity and sex, the main effect of ethnicity was significant, $F(1, 295) = 12.60$, $p < .017$, at the Bonferroni adjusted level, suggesting there did exist significant difference between the two groups in the affective dimension of leisure attitudes, and that Anglo-Canadians ($M = 4.25$, $SD = 0.52$) valued the affective dimension of leisure attitudes more than did Chinese ($M = 3.92$, $SD = 0.61$). However, neither of the other main effects nor the interaction effect was significant ($p > .05$).

Based on the above, **H12: There exist significant differences in leisure attitudes between Chinese in Canada and Anglo-Canadians** was supported by the MANCOVA and follow-up ANCOVAs, where the two groups did differ significantly in the two of the three dimensions of leisure attitudes--cognitive and affective, and marginally in the third dimension--behavioral. That is, in comparison with the Chinese respondents, Anglo-Canadians were more likely to realize the importance of leisure for human beings, were more affectively attached to leisure, and were more likely to spend time and money to participate in leisure activities. Therefore, **H14: Leisure attitudes held by Anglo-Canadians are more positively valued than is the case of Chinese in Canada** was also supported.

Hypothesis Test: Acculturation

In order to test H13: The greater level of acculturation a Chinese person has, the more likely his or her leisure attitudes will be similar to those of Anglo-Canadians, a MANCOVA was first performed on the three scales, and follow-up pair comparisons were then performed.

The means and standard deviations for the three scales are presented in Table 4-115. As the table indicates, the Chinese with high acculturation were consistently lower in the three means than Anglo-Canadians, and than the Chinese with low acculturation. This indicates that acculturation did not play a role in changing the Chinese respondents' attitudes toward leisure as hypothesized.

Table 4-115

Descriptive Statistics for Leisure Attitudes-Acculturation

			Chinese			
	Anglo-Canadians		High Acculturation		Low acculturation	
Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*
Cognitive	4.64	0.44	4.42	0.53	4.61	0.37
Behavioral	3.66	0.69	3.49	0.72	3.59	0.58
Affective	4.25	0.52	3.86	0.65	4.00	0.52

In order to statistically test the differences in leisure attitudes among the three groups, a MANCOVA with two grouping factors (i.e., acculturation, Anglo-Canadians, $n = 138$, Chinese with high acculturation, $n = 54$, and Chinese with low acculturation, $n = 49$; and sex, female, $N = 108$, male, $N = 133$) and three covariates (i.e., age, education, and income) was performed on the three dependent variables. The Box's M test indicates that the homogeneity of variance-covariance was met, $F(30, 37806) = 0.86, p > .05$. The assumption of homogeneity of regression slopes was met except for the variable of income, where the interaction effect between group membership (acculturation) and income was significant ($p < .05$) (Table 4-116). However, as discussed previously, the effect on statistic power as a result of the minor violation of this assumption is inconsequential. None of the interaction effects between each pair of the three variables, income, education, and age, was significant ($p > .05$) (Table 4-117), indicating the appropriateness of the inclusion of them as covariates in the MANCOVA. The results of the MANCOVA are presented in Table 4-118.

Table 4-116

Tests of Homogeneity of Regression for Leisure Attitudes-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*
Acculturation * Income	0.73	1.68	24, 357	.025*
Acculturation * Education	0.85	1.66	12, 326	.074
Acculturation * Age	0.82	0.96	27, 360	.524
Sex * Income	0.94	0.64	12, 339	.810
Sex * Education	0.97	0.56	6, 256	.763
Sex * Age	0.89	1.01	15, 354	.441

Note. Interactions were separately tested on acculturation and sex; $*p < .05$.

Table 4-117

Tests of the Appropriateness of the Three Independent Variables (i.e., Age, Education, and Income) as Covariates for Leisure Attitudes-Acculturation

Source	Wilks' Λ	*F*	*df*	*p*
Income * Education	0.92	0.56	33, 661	.979
Income * Age	0.85	0.65	54, 641	.974
Education * Age	0.87	0.78	42, 692	.839

Note. Interactions were separately tested on each pair.

Table 4-118

Multivariate Analysis of Covariance for Leisure Attitudes-Acculturation

Effect	Wilks' Λ	*F*	*df*	*p*	η_p^2	β
Income	0.99	1.06	3, 230	.365	.01	.29
Education	0.97	2.28	3, 230	.080	.03	.57
Age	0.99	0.80	3, 230	.494	.01	.22
Acculturation (A)	0.92	3.23*	6, 460	.004	.04	.93
Sex (S)	1.00	0.29	3, 230	.833	.00	.11
A * S	0.98	0.69	6, 460	.658	.01	.28

Note. $*p < .001$.

After holding the demographic characteristics constant and considering the interaction between acculturation and sex, the three groups did differ overall in regard to their attitudes toward leisure, Wilks' Λ = 0.92, F (6, 460) = 3.23, $p < .001$ (Table 4-118). It was estimated that 4% of the variance in the two dependent variables can be attributed to group membership ($\eta_p^2 = .04$), and probability of rejecting the null hypothesis when it is false is .93 ($\beta = .93$). Neither of the main effects with regards to income, education, age and sex nor the interaction effect between group membership and sex was significant ($p > .05$).

On the basis of the analysis, significant differences were shown to exist in leisure attitudes among the three groups. The significant simple main effect of group membership was further analyzed by pairwise comparisons using the Bonferroni adjustment for multiple comparisons. Table 4-119 presents the results of this analysis for estimated marginal means. The pairwise comparisons are presented in Table 4-120.

Table 4-119

Estimated Marginal Means for Leisure Attitudes

Dependent Variable	Groups	*M*	*SE*	95% Confidence Interval	
				Lower Bound	Upper Bound
Scale 1	High acculturation	4.39	0.07	4.25	4.52
	Low acculturation	4.62	0.07	4.48	4.75
	Anglo-Canadians	4.65	0.04	4.57	4.73
Scale 2	High acculturation	3.48	0.10	3.28	3.68
	Low acculturation	3.63	0.10	3.43	3.83
	Anglo-Canadians	3.65	0.06	3.53	3.77
Scale 3	High acculturation	3.89	0.08	3.73	4.06
	Low acculturation	4.01	0.08	3.85	4.18
	Anglo-Canadians	4.24	0.05	4.14	4.34

Note. Means evaluated at covariates appeared in the model: Income = 2.79, Education = 2.88, Age = 2.89.

Table 4-120

Pairwise Comparisons for Leisure Attitudes

Dependent variables	Groups I	Groups J	Mean difference (I – J)	*SE*	*p*	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Scale 1	High acculturation	Low acculturation	-0.23*	0.09	.043	-0.46	0.00
		Anglo-Canadians	-0.27**	0.08	.005	-0.47	-0.06
	Low acculturation	Anglo-Canadians	-0.03	0.08	1.000	-0.23	0.16
Scale 2	High acculturation	Low acculturation	-0.15	0.14	.827	-0.49	0.18
		Anglo-Canadians	-0.17	0.12	.486	-0.47	0.13
	Low acculturation	Anglo-Canadians	-0.02	0.12	1.000	-0.32	0.27
Scale 3	High acculturation	Low acculturation	-0.12	0.11	.873	-0.40	0.15
		Anglo-Canadians	-0.35**	0.10	.002	-0.59	-0.10
	Low acculturation	Anglo-Canadians	-0.22	0.10	.079	-0.47	0.02

Note. The multiple comparisons based on estimated marginal means with adjustment Bonferroni; **p* < .05, ***p* < .001.

In the case of scale 1, cognitive dimension of leisure, the Chinese with high acculturation were significantly different from the Chinese with low acculturation, $p < .05$, at the Bonferrroni adjusted level, while were more significantly different from Anglo-Canadians, $p < .001$ (Table 4-120). There was no significant difference in this dimension between the Chinese with low acculturation and Anglo-Canadians. In terms of scale 2, behavioral dimension of leisure, the three groups were not significantly different from one another. Finally, for scale 3, affective dimension of leisure, while there was no significant difference between the Chinese with high acculturation and the Chinese with low acculturation, the former did differ significantly with Anglo-Canadians, $p < .001$, at the Bonferroni adjusted level, but the latter did at the unadjusted Bonferroni level, $p < .05$ (i.e., $p = .079/3 = .03$).

Based on the above, **H13: The greater level of acculturation a Chinese person has, the more likely his or her leisure attitudes will be similar to those of Anglo-Canadians** was not supported by the pairwise comparison analyses, where there was no significant difference among the three groups in attitudes toward the behavioral dimension of leisure. Moreover, differences in attitudes toward the other two dimensions of leisure, cognitive and affective, were greater between the Chinese with high acculturation and Anglo-Canadians than between the Chinese with low acculturation and Anglo-Canadians, which is opposite to the initial hypothesis.

Within Group Issues

For the two groups, the relationships among the three leisure sub-scales were examined by correlation analyses. The results are reported in Table 4-121 and Table 4-122. In addition, each scale was regressed on sex, age, education, and income for Anglo-

Canadians. One more variable, acculturation, was added in the regression analyses for the Chinese.

Table 4-121

Zero-Order Pearson Correlation Coefficients among Three Leisure Sub-Scales for Anglo-Canadians (Maximum N = 156)

	Cognitive	Behavioral	Affective
Cognitive	_		
Behavioral	.36*	_	
	(.000)		
Affective	.56*	.52*	_
	(.000)	(.000)	

Note. Values in parentheses refer to *p* values; **p* < .001.

Table 4-122

Zero-Order Pearson Correlation Coefficients among Three Leisure Sub-Scales for Chinese (Maximum N = 177)

	Cognitive	Behavioral	Affective
Cognitive	_		
Behavioral	.40*	_	
	(.000)		
Affective	.64*	.54*	_
	(.000)	(.000)	

Note. Values in parentheses refer to *p* values; **p* < .001.

Anglo-Canadians. Among Anglo-Canadians, all three leisure scales were positively significantly related to one another ($p < .001$), indicating that the three dimensions of leisure attitudes were closely related with each other. It should be noted that the correlation between affective and behavioral sub-scales (.52) was greater than that between cognitive and behavioral (.36). This suggested that behaviroal intentions may be caused more by what is felt than by what is known about leisure activities.

Sex, age, education, and income were not significantly related to either cognitive or affective scales. However, income was the single variable that was significantly related to behavioral scale ($p < .05$), with those with a higher level of income being more likely to participate in leisure activities than those with a lower level of income. Interestingly, only age was negatively related to the three sub-scales while sex, education, and income were not. This finding implied that those who were more educated, affluent, and younger tend to have positive beliefs, likings, and intentions about leisure activities. Moreover, males were more positive about leisure than were females.

Chinese. Among the Chinese, the same patterns occurred with respect to intercorrelations among the three sub-scales when compared with Anglo-Canadians. For instance, all three leisure sub-scales were significantly related to one another ($p < .001$), and the relationships were positive. In addition, the correlation between affective and behaviroal scores (.54) was larger than that between cognitive and behavioral (.40).

The above four variables along with acculturation were not significantly related to cognitive and behavioral scores while education was the single variable that was significantly related to the affective dimension of leisure attitudes ($p < .001$), with those who were well-educated had more negative feelings about leisure than did those who were less educated. In addition, sex was negatively related to cognitive and behavioral scores while being positively related to the affective sub-scale. Age, education, and income were negatively related to all three sub-scales. Finally, acculturation was negatively related to the cognitive sub-scale but was positively related to affective and behavioral sub-scales.

The relationships of national park visitation to the above variables were also assessed by regression analyses (Table 4-123). The results indicated that the relationship patterns for both groups were the same. That is, sex, education, and income were positively related to frequency of visits to national parks while age was negatively related to frequency of visits. However, only income was significantly related to visit times with individuals with higher level of income being more frequent to national parks than those with lower level of income, this is particularly true for the Chinese ($p < .001$). In addition, the high acculturated Chinese tend to visit national park more than does the low acculturated, however, this relationship was not significant ($p > .05$).

Table 4-123

Regression Analysis of Visitation Rates to National Parks on Sex, Age, Education, Income, and Acculturation (for Chinese)

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	*SE*	Beta	*t*	Sig
Sex	0.73	0.38	0.16	1.90	.060
	(0.36)	(0.31)	(0.09)	(1.17)	(.246)
Age	-0.24	0.14	-0.14	-1.71	.089
	(-0.21)	(0.15)	(-0.11)	(-1.41)	(.160)
Education	0.34	0.25	0.13	1.49	.139
	(0.26)	(0.19)	(0.11)	(1.30)	(.194)
Income	0.33	0.16	0.19	2.14*	.034
	(0.39)	(0.14)	(0.25)	(2.81**)	(.006)
Acculturation	(-0.24)	(0.37)	(-0.05)	(-0.64)	(.522)

Note. Values in brackets refer to the Chinese; $R = .37$, $R^2 = .13$, Adjusted $R^2 = .11$ (Anglo-Canadians); $R = .36$, $R^2 = .13$, Adjusted $R^2 = .10$ (Chinese); $*p < .05$, $**p < .001$.

The relationships of the three sub-scales to national park visitation were also examined (Table 4-124). As shown, for both groups, all three sub-scales were positively related to visit times. This indicated that visitation to national parks can enhance individuals' attitudes toward leisure or vice versa. However, none of the relationships among the Chinese was significant ($p > .05$). Among Anglo-Canadians, the affective ($p < .05$) and behavioral scales ($p < .001$) were significantly related to park visitation while the cognitive was not ($p > .05$).

Table 4-124

Regression Analyses of the Three Leisure Sub-Scales on National Park Visitation

Dependent variables	Unstandardized Coefficients		Standardized Coefficients			
	B	*SE*	Beta	*t*	Sig	R^2
Cognitive	0.02	0.02	0.11	1.29	.201	.01
	(0.02)	(0.02)	(0.09)	(1.09)	(.276)	(.01)
Behavioral	0.09	0.02	0.31	3.96**	.000	.10
	(0.01)	(0.03)	(0.04)	(0.51)	(.609)	(.01)
Affective	0.05	0.02	0.20	2.50*	.014	.04
	(0.04)	(0.03)	(0.12)	(1.58)	(.116)	(.02)

Note. Values in brackets refer to the Chinese; $^{*}p < .05$, $^{**}p < .001$.

Conclusion

This subsection compared the distribution patterns of frequency of response with respect to leisure attitudes between the two groups, Anglo-Canadians and Chinese; determined three dimensions of leisure attitudes using factor analysis; and tested three hypotheses with two regarding ethnicity and one regarding acculturation, respectively.

The results indicate:

1. As is the case for attitudes toward national parks and the environment, the response patterns for the two groups in a large number of items measuring leisure attitudes were similar. That is, those items that were responded to by a majority/minority of Anglo-Canadians were also responded to by a majority/minority of Chinese. However, Chinese respondents were more likely to choose the middle ones and less likely to choose the extremes along a spectrum of choices. The similarity index for this measure is 2.96 (see Appendix G).

2. The leisure attitudes discussed in this study are multiple dimensional with three dimensions respectively measuring people's attitudes toward cognitive, affective, and behavioral aspects of leisure.

3. The two groups did differ overall in attitudes toward leisure, but not equally significantly among the three dimensions. Specifically, the differences in the cognitive and affective dimensions of leisure attitudes were much greater than that in the behavioral dimension, suggesting the intended leisure behaviors could be similar between both groups although their cognition of and affection on leisure were largely different.

4. Acculturation did not at all play a role in changing the Chinese people's leisure attitudes toward becoming more similar to Anglo-Canadians as anticipated.

5. People's attitudes toward leisure tend to be homogenous regardless of sex, age, education (not applicable to the Chinese), and income. This is particularly true for Anglo-Canadians. For the Chinese, education was the single factor that was significantly related to leisure attitudes, with those who were well-educated were less likely than those who were less educated to endorse the affective domain of leisure attitudes.

CHAPTER FIVE

DISCUSSION

This section discusses the effects of acculturation on the 20 sub-scales derived from factor analysis on all six measures regarding national parks, the environment, and leisure. In addition, discussion specifically with regard to each of these three study areas is presented.

The results presented suggest that acculturation does not act consistently in the anticipated direction as stated in the hypotheses for all 20 sub-scales that are derived from factor analysis. For instance, acculturation acts on five of the 20 sub-scales (25%). These are "accommodation and service facilities", "consumptive activities", and "visitor facilities" (sub-scales of national park appropriate use) ($p < .05$, at the unadjusted level), "social- altruistic value orientation" (sub-scale of environmental values), and "anti-anthropocentrism" (sub-scale of the NEP), where the low acculturated Chinese are significantly different from Anglo-Canadians, while the high acculturated Chinese are not.

Contrary to the acculturation thesis, the high acculturated Chinese are significantly different from their Anglo Canadian counterparts on four of the 20 sub-scales (20%). These are "priority on ecological integrity" (sub-scale of national park policy), "ecological integrity" (sub-scale of national park roles and functions, at the unadjusted Bonferroni level) ($p < .05$), "non-consumptive activities" (sub-scale of national park appropriate use), and "cognitive" dimension of leisure attitudes. In addition, Chinese respondents, regardless of their acculturation level, are significantly different from Anglo-Canadians on five of the 20 sub-scales (25%). These five are "compromise between use and protection" (sub-scale of national park policy), "non-market values" (sub-scale of national park roles and functions), "motorized activities" (sub-scale of national park appropriate use), "limits to growth" (sub-scale of the NEP), and affective dimension of leisure attitudes (low acculturated Chinese are different from Anglo-Canadians, at unadjusted Bonferroni level, $p < .05$). Finally, Chinese respondents, regardless of their acculturation level, are not significantly different from Anglo-Canadians on six of the 20 sub-scales (30%). These sub-scales are "leisure opportunity" (sub-scale of national park roles and functions), "sport/recreation facilities" (sub-scale of national park appropriate use), "biospheric value orientation" (sub-scale of environmental values), "ecocrisis" and "balance-of-nature" (sub-scale of the NEP), and "behavioral" dimension of leisure attitudes.

There are four sub-scales, where there are significant differences (at the adjusted Bonferroni level) between the two ethnic groups. Moreover, these significant differences (at the adjusted Bonferroni level) exist between them, regardless of the acculturation level of the Chinese. Likewise, there are eight sub-scales, where there are not significant differences (at the adjusted Bonferroni level) between the two ethnic groups, once again there are not significant differences (at the adjusted Bonferroni level) between them, regardless of the Chinese's acculturation level. These sub-scales account for 60% of the total sub-scales (i.e., 12/20 = .60). If a ratio can be taken to indicate the predictability between ethnicity and acculturation, this ratio could be 3: 1 (i.e., 60%: 20% = 3: 1, where 60% refers to the percent accounted for by the sub-scales that ethnicity acts on, and 20% refers to the percent accounted for by the sub-scales that acculturation acts on in anticipated direction, both at the adjusted Bonferroni level).

This study suggests that ethnicity plays a more important role than acculturation in determining attitudes toward national parks, the environment, and leisure. Furthermore, this finding is further supported by the fact that the high acculturated Chinese are not significantly different from their low acculturated counterparts for almost all 20 sub-scales except the cognitive dimension of leisure attitudes[4] (*Note*. [4]Discrepancies existed when results from regression analyses with regard to such sub-scales as "compromise between protection and use"; "motorized activities"; the cognitive dimension of leisure attitudes, and "anti-anthropocentrism" are compared with those from pairwise comparisons. These discrepancies could be due to the use of observed scores of all participants in the regression analyses vis-à-vis the use of unweighted means of selected participants in the pairwise comparisons). Moreover, a further examination (which is not presented in this study due to length considerations) indicates that there are no significant differences across all 20 sub-scales between those Chinese who identified themselves as being Chinese and those who identified themselves as being Chinese Canadians. Chinese participants appear to be homogenous in attitudes examined both from the perspective of acculturation and ethnic identity. Consequently, it may be concluded that ethnicity is an important contributor in accounting for the similarities and differences in attitudes between the two ethnic groups toward the three study areas. The following is a more detailed discussion specifically with regard to each of the three areas--national parks, the environment, and leisure.

National Parks

The results of this study indicate that ethnicity, after holding age, education, and income constant and considering the interaction effect between ethnicity and sex, does affect the differences in attitudes that are held by Chinese in Canada and Anglo-Canadians toward national park policy, roles and functions, and appropriate uses. Compared to Anglo-

Canadians, the Chinese hold negative attitudes toward Park's Canada's policy of placing priority on ecological integrity, in that they tend to be less supportive of Park's Canada's policy on limiting visitor numbers, restricting and phasing out inappropriate uses while being more likely to support the provision of more recreational activities and facilities. Moreover, they tend to be more supportive of the compromise between use and protection than Anglo-Canadians. The differences could be explained in part by the following:

1. The Chinese are less likely to have access to relevant information about the current conditions of Canada's national parks, and they are therefore less likely to realize the necessity of placing priority on protection and safeguarding ecological integrity.

2. The observation has already been made that China's national parks (or, more accurately, the equivalents of national parks such as national forest parks, national scenic areas, and national nature reserves) suffer from inadequate resource management, over crowding, deterioration of the park environment, and high level of urban-type infrastructure and development (Nianyang & Zhuge, 2001). Moreover, the approach to protected area management in China is primarily based on landscape aesthetics (facade management) rather than a science-based ecological approach (Nianyong & Zhuge, 2001; Pritchard, 2001). Although Parks Canada has been criticized for not adopting a sufficiently rigorous ecological and science-based approach to park management in the past (see Parks Canada Agency, 2000b), most national park environments in Canada convey a sense of wildness and naturalness. Consequently, the majority of visitors perceive the landscape as being ecologically healthy (see Swinnerton, 2002). This perspective would apply specifically to Chinese immigrants based on their experience

with national parks in their own country. The outcome from such a perspective is a tendency to be unaware of the nature and seriousness of the ecological issues facing Canada's national parks.

3. Parks, including national parks, according to Chinese culture, imply places for people to play in. When such a place is full of people, the place is deemed to be *renao* (热闹), which means having fun and excitement (Gabrenya, Jr & Hwang, 1996), and "is one of the few ways the Chinese throughout the ages were permitted to loosen up, let their hair down and enjoy themselves" (DeMente, 1996, p. 328). Therefore, recreation/play for them seems to be the first priority of a park or even a national park. As one Chinese respondent commented:

> National parks differ from protected areas. If the natural environment in national parks is overly protected while leisure activities are restricted, people will lose their interests in national parks. Consequently, the meanings implied by national parks are reduced. Therefore, there is a balance between leisure development and environmental protection, that is, to meet people's demand for leisure and recreation, in the mean time, not to unduly impact the natural environment in national parks.

4. Not all Chinese respondents are able to differentiate national parks from other protected areas such as provincial or city parks. For instance, approximately 13% (23 out of 178) of the Chinese respondents identified at least one provincial or city park as a national park when asked to name three of Canada's national parks they have visited during the past 12 months. This confusion occurred only to 5% (8 out of 160) of the Anglo-Canadian respondents. This response pattern suggests that the Chinese are less

knowledgeable about Canada's national parks than Anglo-Canadians. Moreover, the Chinese are more likely than their Anglo-Canadian counterparts to underestimate the importance of the protection of ecological integrity in national parks even though in reality they are provincial or city parks.

5. People tend to be more concerned about environmental issues that have immediate implications for them personally. For example, studies conducted in Poland suggested that "ecological values of practical importance, directly related to people's living conditions, such as clean air, drinking water, and forestation, are particularly high in the hierarchy of ecological importance, while national parks take a somewhat lower position" (Rokicka, 2002, p. 79). Understandably, as immigrants, the first priority for most Chinese is placed on studying and/or finding employment. Therefore, the protection of national parks appears to be relatively distant for them and does not have an immediate implication on their daily lives. Moreover, Chinese immigrants are less affluent than Anglo-Canadians. It is likely that "less affluent individuals are required to focus more on their own and their family's material self-interest in order to survive and thus have less opportunity to engage in costly environmentally friendly behavior than affluent individuals" (Kemmelmeier et al., 2002, p. 258).

6. "Connection to place drives people to protect the environment" (Scott, 2002, p. 3). Canadians are emotionally attached to national parks. They "feel a sense of involvement in, and responsibility for, their national parks" (Banff-Bow Valley Study, 1996, p. 15). However, it is less likely for immigrants, and especially those who have not yet developed their sense of place, to have developed the same level of attachment and care about national parks, as expressed by Canadians. Meeker et al. (1973) pointed out

that “national parks are symbolic of white man’s domination and exclusiveness” (cited in Edwards, 1981, p. 97).

7. Chinese are more likely to choose the middle range of responses (Yang, 2002), resulting in their scores being lower when expected to be higher, or vice versa. This phenomenon could be the function of Chinese culture, where the Confucian principle of "keeping to the middle way" (i.e., *zhongyongzhdao* 中庸之道; Chen, Lee, & Stevensen, 1995), appears to remain important for some Chinese even today. This perspective could account for some of the responses made by the Chinese. This probability could have been substantiated in those instances when respondents were not aware of Park’s Canada’s policy. Evidence of this is demonstrated by some respondents in the open-ended comments. For instance, one Chinese respondent noted:

> My choices for some questions seem not to be appropriate. Currently, I did not have much understanding about some of the questions for which my choices are ‘neutral’. I am not sure if ‘neutral’ can cover my choices. Instead, I am more inclined to use ‘do not know’.

The above explanations could help to explain why the Chinese are not significantly different from their Anglo-Canadian counterparts in two aspects of national park roles and functions--ecological integrity and leisure opportunities, although they do differ in attitudes toward national park policy. Understanding national parks as places for the protection of the environment and resources as well as places for the provision of leisure opportunities does not require the same level of knowledge or information on policy or regulations, or management operations regarding Canada’s national park. Moreover, protection and use have traditionally been the dual mandates of national parks for long time in many countries, including China and Canada. Therefore, it is not too surprising that their perceptions of these aspects are generally similar.

However, both groups did differ significantly in the third aspect of national park roles and functions--non-market values such as promotion of a sense of Canadian identity, places for spiritual enjoyment and future enjoyment. It should be noted that mean scores for the two groups on two of the seven items included in this scale--item 18 "National parks function to preserve biological diversity" (*M* = 4.28 for Anglo-Canadians vs. *M* = 4.26 for the Chinese) and item 19 "National parks are places to protect scenic beauty of nature" (*M* = 4.74 for Anglo-Canadians vs. *M* = 4.57 for the Chinese) are relatively closer than those on the remainders (i.e., items 11, 14, 15, 16, and 17). Therefore, the significant difference in this scale comes from the five other items, with item 14 "National parks are places to be protected for the enjoyment of future generations" contributing the most (i.e., the mean score for Anglo-Canadians is 1.09 greater than that for the Chinese), followed by item 15 "National parks are places for all living things to exist" and item 16 "National parks help to reduce global warming" (mean scores on these two items for Anglo-Canadians are 0.58 greater than that for the Chinese, respectively), and item 11 "National parks help to promote a sense of Canadian identity" (the mean score for Anglo-Canadians is 0.46 greater than that for the Chinese).

Not surprisingly, the Chinese, especially those who still identify themselves as being Chinese, are less likely to accept that national parks help to promote a sense of their Canadian identity as compared to the views expressed by Anglo-Canadians. For example, 71% of Canadians see national parks as the fourth "very important" symbol of Canadian identity (the first three are the Charter of Rights, the flag, and the health care system;

Environics, 1997, cited in Parks Canada Agency, 2000b). However, it is less obvious why the Chinese are significantly different in terms of other items, especially items 14, 15, and 16. Further endorsement of national parks being a symbol of Canadian identity is demonstrated by some Anglo-Canadians who expressed their pride in, and attachment to, Canada's national parks. This perspective was not provided by any of the Chinese respondents. For instance, one Anglo-Canadian stated:

> I have had a number of relatives from Australia visit over the past few years. All of them wanted to see the Rocky Mountains (Banff/Jasper) and were thrilled to see large animals in the wild (bear, deer, elk, mountain sheep along the highways). I have taken great pride in showing these guests Banff, Jasper and Elk Island National Parks.

In the case of item 14, approximately 11% (6 out of 56) Anglo-Canadians who completed the open-ended survey emphasized the importance of national parks as places for the enjoyment of future generations. In contrast, only about 6% (3 out of 47) of the Chinese respondents expressed a similar opinion. This finding is consistent with Kempton's et al. (1995) finding that a majority of American respondents justified the environmental protection largely by both the needs of future generations as well as aesthetic enjoyment. One potential explanation for such a difference could be related to emotional/symbolic attachment, where Canadians are highly attached to national parks, emotionally and symbolically such that they cherish their family memories and traditions which are associated with the parks. Furthermore, they treat parks as havens for the soul and for replenishment (Parks Canada Agency, 2000b). This perspective does not seem to be the case for the Chinese, who have not yet developed a sense of place with respect to national parks. Moreover, traditionally, the Chinese do not see leisure/recreation as an important and effective means by which the family members can be spiritually, emotionally, or mentally united as it is the case for Westerners (Wang & Stringer, 2000).

The finding with reference to item 15 suggests that the Chinese do not value the harmonious relationship of human beings to nature. This result would appear to be inconsistent with what is believed traditionally about the Chinese. One possible explanation could be that the Chinese place more emphasis on the role of national parks as places for people to recreate and play as discussed above and, consequently, the non-market value of a park or a national park is of secondary importance. Alternatively, it could be that the Chinese are indeed less concerned about the human being's harmonious relationship with nature than Anglo-Canadians, as will be discussed below with regard to the NEP. Finally, for item 16, both groups, particularly the Chinese, tend to be less likely to view national parks as places for reducing global warming compared to their scores on national parks' roles as places for the protection of ecological integrity. This position could be explained by the social exchange theory discussed in the literature review section. According to this theory, people tend to evaluate the exchange relative to their personal benefits and costs. Obviously, the protection of ecological integrity is an important prerequisite for the provision of many leisure/recreation opportunities. In contrast, the relationship between ecological integrity and the reduction of global warming is much more obscure. Therefore, concern over the national park's function to reduce global warming appears to be far more distant than that experienced for ecological integrity, and much further from the minds of the lower income profile. This situation would apply to the Chinese in this study, who are relatively less wealthy than their Anglo

Canadian counterparts (cf. Valenzuela, 1995). A similar finding was reported in China, where, the Chinese appeared to be genuinely concerned about addressing domestic environmental problems, but they demonstrated little interest in dealing with international problems such as global warming (Bardeen, 1995).

The Chinese respondents' past experience with and knowledge of China's national parks could also explain the similarities and differences in attitudes toward appropriate uses. Consistent with their consensus with Anglo-Canadians on national parks as places for providing leisure opportunities, the Chinese share similar attitudes with their Anglo Canadian counterparts toward sports/recreation facilities and visitor facilities, in that they both consider sports/recreation facilities to be less appropriate than visitor facilities. Mention has already been made that, viewing scenery is the main opportunity provided by China' national parks and the beauty of natural scenery is the main criterion for a place to be designated as a park or a national park. Nevertheless, large number of visitors, too much man-made construction, and too many buildings are prevalent phenomena in most of China's national parks. Although a number of Canada's national parks face similar problems, they are generally better managed and less crowded than China's national parks. As a result, the Chinese are less likely than Anglo-Canadians to consider accommodation and service facilities, as well as non-consumptive activities such as camping and rock-climbing/mountaineering, to be appropriate. However, the Chinese are not significantly different from Anglo-Canadians with regard to those activities with which they are familiar. For instance, the mean scores for the both groups are quite close on such items as "jogging/running/walking", "wildlife watching", and "taking pictures". Therefore, the differences in attitudes held by the Chinese toward non-consumptive activities, compared with Anglo-Canadians, are largely contributory to those activities (e.g., "rock-climbing/ mountaineering", "picnicking/barbecuing", "mountain biking") that are not popular within China's national parks. Thus, it seems that the Chinese are more accepting of traditional activities or familiar activities. This proposition is further supported by the finding regarding motorized activities, such as power boating ($M = 1.80$ for Anglo-Canadians vs. $M = 3.03$ for the Chinese), which is considered to be more appropriate by the Chinese. It should be noted once again that sightseeing by car is also included in this sub-scale. However, it is not typical of China's national park activities, and therefore, the Chinese are slightly less likely to consider it to be appropriate ($M = 3.97$ for Anglo-Canadians vs. $M = 3.77$ for the Chinese). As a result, the significant difference between the two groups' attitudes on this scale is largely due to the difference in their perception of power boating.

This so called "familiarity" effect is also supported by the finding that consumptive activities, such as gathering natural edible products, fishing, and hunting (*Note*. This activity is not included in the scale of consumptive activities based on factor analysis)--which are typical of the Chinese tradition--are more likely to be considered appropriate by the Chinese. For example, the Chinese do not think such activities, particularly gathering natural edible products, pose a threat to the environment or specifically to ecological integrity.

A similar finding, although not specifically related to the Chinese, was reported by Anderson, Blahna, and Chavez (1999), who found that many Asian-Americans (mostly Koreans and Japanese) pick the young bracken fern fiddleheads for use in holiday and everyday meals. Ecologically, they think, contrary to managers' perceptions, "picking bracken fern does not endanger the ferns" (p. 759). Additionally, picking and processing bracken fern fiddleheads "serves to reinforce ethnic-group affiliation" (p. 759). Another study on the Chinese conducted by Allison and Geiger (1993) found that gardening may mean different things to the Chinese American elderly and their White counterparts. For Chinese Americans, gardening is more production-oriented. Similar findings have also been reported for other minority members. For instance, Toth and Brown (1977) found that African Americans viewed the importance of fishing as a subsistence activity while for Whites, the importance of fishing is primarily for sport (cited in Floyd 1999). These studies indicate that Chinese, along with other minority members, tend to value leisure activities that are materially productive, not simply for fun. Additionally, eating is an important activity of Chinese culture (Chang, 1977; Redding, 1990; cited in Gabrenya, Jr & Hwang, 1996) and it is said that the Chinese eat whatever can run. Therefore, it is understandable that Chinese respondents are more likely to support fishing and hunting.

The above reported similarities and differences remain to a large extent even when the effect of acculturation is considered. For instance, acculturation does not act (at the adjusted Broferroni level) on one of the two national park policy sub-scales (50%) "compromise between use and protection", all three sub-scales (100%) of roles and functions, and three of six sub-scales (50%) of appropriate uses--sports/recreation facilities, motorized activities, and visitor facilities. This suggests that Chinese respondents' perception of roles and functions, which generally reflects their worldview or belief system toward natural resources, are more stable compared to their perception of park policy and appropriate use, which are easily influenced by an individual's knowledge and first-hand experience.

Acculturation affects Chinese respondents' attitudes in the anticipated direction with reference to only two of a total of 11 sub-scales (18%). These two sub-scales both fall into national park appropriate uses--accommodation and service facilities and consumptive activities. In both of these instances, the low acculturated Chinese are significantly different from Anglo-Canadians, while the high acculturated are not. However, it does not affect the Chinese respondents' attitudes in the anticipated direction toward two sub-scales (18%), with one being the national park policy sub-scale, "priority on ecological integrity", and the other being appropriate use sub-scale, "non-consumptive activities", where the high acculturated Chinese are significantly different from Anglo-Canadians, while the low acculturated are not.

One possible explanation for this dichotomy is that those who are less acculturated are new arrivals. They are usually younger and well-educated. Therefore, they are more likely to participate in or accept activities such as camping, mountain biking, rock-climbing/ mountaineering, and picnicking/barbecuing, which are especially popular with younger people. Moreover, they tend to be more supportive of "priority on ecological integrity" than their older counterparts because they are more experienced, more informed and well-educated. Therefore, it is those who have a longer length of residence who are higher acculturated, and it is they who share the similar attitudes to those of Anglo-Canadians regarding "accommodation and service facilities" and "consumptive activities". Since acculturation was significantly related to age, education, length of residence, that is, the younger, the well-educated, and those with longer length of residence were more likely to be acculturated, there could be some complex interactions among these factors. More specifically, those who arrived in Canada in recent years could be considered to be less acculturated, but they were usually younger and well-educated. Therefore, the interactions among these factors and their relationships to national parks should be examined in future studies.

Despite the Chinese being significantly different from Anglo-Canadians in many aspects of national parks, the general response patterns are quite similar for the majority of the scale items. For instance, of the ten statements in the survey that focused on national park policy, four had the greatest frequency of response in either the "mildly agree" or "strongly agree" category for both groups; and of the 20 items relating to the roles and functions of national parks, over 80% of Anglo-Canadians and the Chinese either mildly or strongly agreed with 9 items, although three of these items are different. In addition, of the 28 items relating to appropriate uses, eight were considered highly appropriate by both ethnic groups, with five of these eight items being the same; seven had the greatest frequency of responses in the category "highly inappropriate" for either the Anglo-Canadian or the Chinese group with three being the same for both groups.

In addition, both groups exhibited similar responses in comparison with previous findings. For instance, Angus Reid Group (1996) identified, among Calgary residents, wildlife reserves, hiking, picnicking and bird watching as being the most appropriate activities while gambling casinos, Video lottery terminals (VLTs), new golf courses, theme parks, and motorized boating as being the least appropriate uses for Banff National Parks. Likewise, in current study, the majority of the Chinese and Anglo-Canadians consider wildlife watching (79.9% for Anglo-Canadians vs. 62.7% for the Chinese), and hiking/backpacking (66.9% for Anglo-Canadians and 46.6% for Chinese) as being most appropriate while gambling/casinos (93.0% for Anglo-Canadians and 76.8% for Chinese), golf courses (27.7% for Anglo-Canadians and 25.6% for Chinese), and power boating (51.3% for Anglo-Canadians) are considered as being highly inappropriate.

Finally, the Chinese have similar national park visitation patterns when compared to with Anglo-Canadians. For instance, 71.0% of Chinese and 72.6% of Anglo-Canadians reported having visited a national park in the past 12 months, with the visitation rate being 1.57 and 2.08 times, respectively. This finding could help change the stereotypical point of view that minority members tend to visit national parks less frequently. For instance, previous studies and survey results suggested that minority groups have been historically underrepresented in terms of national park visitation. For example, the 1982-1983 National Recreation Survey showed that 83% of non-White minorities reported having never visited a national park, nearly twice that of White respondents. Similarly, in the 1986 Market Opinion Research, Hispanic Americans reported the lowest frequency of use of federal parks, forests, and recreation area. In addition, a low visitation rate by minority groups was also found in the 1985-87 Public Area Recreation Visitor Study. In this study, over 94% of White respondents reported visiting five federal recreational areas nationwide and 11 state agencies, while only 2.2% were Hispanic American, and 2% were African Americans. Finally, a survey in 1997 revealed that 90% of Yellowstone's visitors were White, 4.1% were of Asian descent, 1.5% were African American, 1% were Hispanic, and 0.5% were American Indian or Eskimo (Wilkinson, 2000).

It could be anticipated that the three attitude measures of national parks are closely interrelated. For instance, a person who has a positive understanding of the roles and functions of national parks will be likely to support the revised policy of placing the maintenance of ecological integrity as the first priority of Parks Canada, and support limiting of the provision of recreational activities, facilities, and services within parks. However, a person who supports the preservation of park environments may still hold the opinion that building hotels within parks is reasonable and appropriate. This argument was supported by correlation analyses for the two groups. For instance, whereas the majority of Canadians support the preservation of park environments as Park Canada's first priority, nearly 75% of Canadians views hotels in national parks to be appropriate (Angus Reid Group, 1993). Likewise, this study also found that the majority of Anglo-Canadians and the Chinese placed higher emphasis on the protection of ecological integrity. However, 57.5% Anglo-Canadians and 44.0% Chinese considered hotel/accommodation to be appropriate; 42.8% Anglo-Canadians and 62.4% Chinese considered restaurants or lounges to be appropriate and, 52.6% Anglo-Canadians and 56.1% Chinese considered gas/service stations to be appropriate. The major reason for this inconsistency could be twofold. First, it could be due to the complexity of measuring appropriateness. In the case of the appropriateness of the existence and development of hotels within parks, no specific information was provided to respondents about the location, size, and number of hotel/accommodation development. Most people, if specifically asked, could think building a large-scale development of hotels and restaurants close to fragile plants and sand dunes within Prince Edward Island National Park is inappropriate for the purpose of maintaining ecological integrity. The similar reaction could be found among respondents if specifically informed that the building of a proposed Convention Centre at Lake Louise in Banff National Park could impact the habitats and movements of grizzly bears within Banff National Park. However, reactions to such commercial development could be quite opposite, if respondents are not specifically informed. Second, although respondents in this study may have been in a position to evaluate the appropriateness of uses in national parks from the perspective of environmental impact, most of them could still think of appropriateness from the perspective of visitors in terms of convenience and necessities.

Environment

This study follows Stern's et al. (1995) approach, where the biospheric-altruistic values were used to measure people's environmental values and the NEP was used to measure people's attitudes toward the environment or their environmental beliefs. Findings from this study with regards to environmental values and attitudes are discussed below.

The results of this study indicate that ethnicity, after holding education, income, and age constant and considering the interaction effect of ethnicity and sex, does overall explain the differences in environmental values between Chinese in Canada and Anglo-Canadians. Specifically, Chinese respondents are significantly more concerned about the social-altruistic aspect of environmental values than Anglo-Canadians, while there is no difference between these two populations with reference to concerns over the biospheric aspect of environmental values. According to Stern et al. (1993), people guided by social-altruistic values are most directly concerned with social good. Accordingly, the Chinese tend to be more concerned with other people's good than with their own. This difference is reflective of the basic culture trait between the two groups, that is, collectivism versus individualism.

According to Triandis (1990, p.39), "people in every culture have both collectivist and individualist tendencies, but the relative emphasis is toward individualism in the West and toward collectivism in the East and South" (cited in Leung & Rice, 2002).

Louie (1997) also points out that collectivism and individualism are two central themes in Asian cultures, and Western European and North American cultures, respectively. Specifically, collectivism is a basic cultural dimension of the Chinese (Chinese Culture Connection, 1987; cited in Chan, 2001).

Steger, Pierce, Steel, and Lovrich (1989) argued that cultural differences in environmental concern are due to collective versus individualistic values. According to Schultz et al. (2000), collectivists tend to focus on other people while individualists focus on themselves, and therefore, collectivists are more environmentally concerned than individualists. In addition, a number of researchers (e.g., Hofstede, 1983; Triandis, 1989; Triandis, Bontempo, Villareal, Asai, & Lucca, 1988) have found that the Chinese tend to "exhibit a relatively strong tendency to subordinate their individual interests in pursuit of group interests, compared to their Western counterparts" (cited in Chan, 2001, p. 392).

Moreover, the Chinese are educated and encouraged to do good for others. Confucianism sees an individual as "a relational being, socially situated and defined within an interactive context" (Bond & Hwang, 1986, p. 215). To be helpful, equal (particularly in reciprocal terms), and just (i.e., social justice) become essential for the maintenance of good relationships among people.

While the Chinese respondents endorsed the social-altruistic values more than did Anglo-Canadians, both group exhibited no difference in biospheric values. The reason could be that there is a convergence point between the two groups with respect to human beings' relationships with nature. That is, while Canada has been experiencing an increase in environmental awareness, the traditional man-nature relationship in China has decreased. According to Jenkins (2002), the Chinese environmental ethic of reverence, compassion and stewardship "[has] been ineffective in inhibiting ecologically destructive human action" (p. 47). As discussed in the literature review, after 1949 when the People's Republic of China was established, traditional Chinese values toward nature have undergone considerable change. This change was a result of religions being banned and temples and churches being destroyed, particularly during the Cultural Revolution (1966-1976). Another factor affecting China's landscapes has been the 1978 adoption of an "open door" policy whereby the Chinese government became more open to the outside world in an attempt to modernize China. To this end, traditional Chinese environmental ideas have been further devalued as they are considered to be obstacles to the development of a modernized society (Wu, 1999). In contrast, the environmental awareness as reflected by the NEP ideas in North America emerged in the late 1970s. Therefore, there is value shift in China and Western countries, where the traditional Chinese worldviews of the harmonious relationship between man and nature began to decrease since 1949 and decreased more quickly since 1980s, while, in the meantime, the Western worldviews of mastery-over-nature began to decrease with the emergence of the ideas endorsed by the NEP. Consequently, a convergence point could be reached in terms of man-nature relationship between the two cultural groups, and accordingly both group endorsed the biospheric values to a similar extent.

It should be noted that social-altruistic values and biospheric values did not act equally on the NEP scales. That is, social-altruistic values were not significantly related to the NEP as evidenced by both groups while bioshperic values were significantly related to three out of four NEP scales--ecocrisis, anti-anthropocentrism, and balance-of-nature. This is true for both groups. This finding is consistent with Stern's et al. (1995) finding that biospheric value orientation is the most important predictor of the NEP.

It is also noteworthy that while the two groups share similar biospheric values, they exhibited significant differences with regard to their environmental attitudes. Generally, values are relatively stable while attitudes are changeable. Values transcend objects, situations and issues whereas attitudes are subject to these factors (Schwartz, 1992). The study has shown that both groups were significantly different in terms of limits to growth and anti-anthropocentrism while they did not differ in ecocrisis and balance-of-nature. Specifically, Anglo-Canadians were more supportive of limits to growth and anti-anthropocentrism than were the Chinese respondents.

As limits to growth was neither related to social-altruistic values nor to biospheric values, the explanations for the difference between the two groups in this regard are beyond these two value orientations. In other words, the difference could be due to variables other than values. One explanation could be related to affluence. Traditionally, China is an agrarian country with a low living standard. Even today, the rural population accounts for the majority of the country's population (Access Asia Limited, 2002). However, mainland China has been improving its living standard through the so called "four modernizations"--agricultural, industrial, military, and scientific for the past few decades. As a result, people's well-being has improved considerably. However, compared with developed countries such as the United States and Canada, China has not yet realize its full potential and, therefore, it is less likely that the Chinese, including those who have immigrated, to realize the limits to growth. Moreover, the Chinese, whether they live in

China, or are residents in Canada, are less materially wealthier than Anglo-Canadians and, therefore, they are more likely to support economic growth.

This finding is consistent with previous findings that "cross-sectional analysis of the ISSP 1993 as well as of the ISSP 2000 suggests that higher proportions of citizens in wealthier nations prefer general environmental protection to economic growth than citizens in poorer countries (Franzen, 2003, p. 306). A similar finding was reported by Dunlap et al. (2000), who found that while other elements of the NEP increased among Washington residents between 1976 and 1990, support for limits to growth declined, probably as a result of energy shortages during that period. Therefore, this difference can probably be explained by the self-interest thesis, where those who are materially or economically disadvantaged tend to be less environmentally concerned. "Individuals living in a society with low wages and high unemployment are less concerned about their natural environment than they are about cost of living and jobs" (Kemmelmeier et al., 2002, p. 259). This argument is further endorsed by the fact that environmental concern among Americans declined in the early 1970s when the United States was in economic depression (Wall, 1993). This explanation was partially supported by results from regression analyses, in that income was positively related to limits to growth for both groups, suggesting that people with lower income were less likely than those with higher income to support limits to growth. However, this relationship is not significant. In contrast, education is the significant factor on limits to growth for the Chinese group but not for Anglo-Canadians. This finding suggests that it is those Chinese, with lower levels of education, who are less likely to support limits to growth as compared to those with higher levels of education. Therefore, education could be the important factor in explaining the difference in limits to growth between the cultural groups.

In the case of anti-anthropocentrism, Chinese respondents were significantly less likely to endorse this NEP dimension than Anglo-Canadians. It was found that, for both groups, age, education, and income were not significantly related to this dimension while biospheric values were. Therefore, the difference in this dimension could be better explained from the perspective of biospheric value orientation. As discussed earlier, there is a convergence point in biospheric values between the two groups. This convergence in biospheric values which are generally stated could still lead to differences in attitudes toward anti-anthropocentrism. It could be that the increase in attitudes held by Anglo-Canadians toward this dimension exceeded the convergence point. In fact, three Chinese respondents remarked that Canada is a more environmentally responsible country than China, with one of them stating that:

> In general I am conservative in regard to Chinese' s attitudes toward nature. Particularly in contemporary times, the respect for nature is far less sufficient. Of course, it is a common phenomenon of all human beings.

Taking into consideration that the majority of the Chinese subjects in this study came to Canada during the past 10 years or so, it is understandable that the Chinese, especially those who arrived Canada in recent years, are less likely than Anglo-Canadians to endorse anti-anthropocentrism. Those who are less acculturated are significantly different from Anglo-Canadians while those who are high acculturated are not. In addition, less acculturated Chinese are significantly less supportive of the anti-anthropocentrism than the high acculturated sub-group. This argument is further supported by findings involving acculturation. It was found that acculturation was significantly positively related to length of residence ($p < .001$). Therefore, less acculturated Chinese are those who have arrived in Canada recently.

There is a significant interaction between sex and ethnicity on this NEP dimension. This is evidenced by the MANCOVA and separate regression analyses. Specifically, Anglo-Canadian females were significantly more supportive of anti-anthropocentrism than their male counterparts while there is no difference between Chinese females and males. In addition, there is no difference between Anglo-Canadian males and Chinese females and males while Anglo-Canadian females endorsed anti-anthropocentrism significantly more than did Chinese females and males. Anglo-Canadian females are the most supportive of anti-anthropocentrism.

Acculturation did not act consistently across the two environmental value sub-scales and four NEP sub-scales. In addition to its effect on anti-anthropocentrism, acculturation was found to influence Chinese respondents' social-altruistic value orientation, in that low acculturated Chinese are significantly different from Anglo-Canadians, while those who are high acculturated are not. As demonstrated earlier, acculturation was positively related to income, education, and length of residence and negatively related to age. Therefore, it is those who are younger, well-educated, relatively affluent, or have lived in Canada for a longer period of time that share the similar social-altruistic values to those expressed by Anglo-Canadians; while the older, new arrivals, the less educated or affluent tend to have maintained this Chinese cultural trait. Previous studies have found that the younger (i.e., Asian students) were even more individualistic than Caucasian students (Louie, 1997) and the middle-class youth in Taiwan tend to more individualistic and westernized (Shaw, 1994). Tata and Leong's (1994) study also suggested that Chinese Americans with higher level of acculturation were also more individualistic compared with those who were not highly acculturated.

While acculturation affected these two sub-scales, it did not affect the other four--biospherical value orientation, ecocrisis, limits to growth, and balance-of-nature. In contrast, ethnicity plays a more important role than acculturation with respect to these four sub-scales, in that similarities or differences between the two groups remain, regardless of acculturation.

Previous studies have also shown that women are more environmentally concerned than men (i.e., Mohai, 1992; Stern, 1992; cited in Chan, 2001; Stern & Dietz, 1994). For instance, Stern and Dietz (1994) found that female university students held stronger biospheric-altruistic values than male students. Consistent with these studies, particularly the one conducted by Stern and Dietz, this study also found that women are more supportive than men of both biospheric and altruistic values than men. However, the interaction effect between gender and ethnicity was not significant. In the case of the NEP, the only gender difference was in relation to anti-anthropocentrism, but this was limited to Anglo-Canadians. Female Anglo-Canadians expressed a stronger endorsement of anti-anthropocentrism than did their male counterparts. However, there was a significant interaction effect on this sub-scale, in that female Anglo-Canadians are significantly more supportive of anti-anthropocentrism than Chinese females and males, while male Anglo-Canadians are not. This finding is partially consistent with Leung and Rice's (2002) study, where he found that Anglo-Australian females endorsed NEP values more than did Chinese-Australian females.

An interesting finding of this study is that, in the case of Anglo-Canadians, sex was the important and consistent predictor of environmental values and one NEP scale--anti-anthropocentrism while age, education, and income were not significantly related to any of the six scales. Likewise, in the case of the Chinese, age, education, and income were not related to five scales except limits to growth, where only the effect of education was found to be significant. In addition, sex was significantly related to social-altruistic values. A conclusion that could be drawn from this finding is that females are more environmentally concerned than males. Moreover, studies of environmental concern could be more effective and meaningful from the perspective of relevant value orientations than from the perspective of socio-demographic variables such as age, education, and income. Stern et al. (1995) have argued that, "research on environmental concern would benefit greatly from a more explicit social-psychological model" (p. 723). This finding also endorsed Dietz et al. (1998) finding that there were stronger associations between environmental concern and social psychological variables such as attitudes, beliefs, and worldviews, than socio-demographic variables.

Contrary to Caro and Ewert's (1995) argument that environmental concern may be influenced to a greater degree by level of acculturation than by ethnicity, this study found that acculturation did not affect consistently across the six sub-scales with only two being influenced by acculturation. Similarities and differences in these four sub-scales are largely a function of ethnicity. This finding supported the theory of selective acculturation by minority members, where some cultural traits are maintained unchanged while some others are not.

Finally, this study supported Stern's et al. (1993) argument that "each value orientation…could produce environmental concern under different conditions" (p. 326). The study indicated that it is biospheric value orientation rather than the social-altruistic value orientation that is closely related to the NEP. Thus, this study could question Leung and Rice's (2002) study, where they explained the differences in the NEP between Chinese Australians and Anglo Australians largely from the perspective of social-altruistic value orientations. However, both studies converged in terms of findings with respect to the NEP, in that Chinese in both studies were less likely to endorse the NEP ideas than their Anglo-Canadian counterparts.

Leisure

The results of this study indicate that ethnicity, after holding age, education, and income constant and considering the interaction effect of ethnicity and sex, did affect the differences in leisure attitudes between Chinese in Canada and Anglo-Canadians. Specifically, the Chinese are most significantly different from Anglo-Canadians in the affective component of leisure attitudes ($p < .001$), followed by the cognitive ($p = .01$) and behavioral components ($p = .54$), with the former being consistently lower in mean scores on the three components than the latter. This finding is consistent with what was found in the past that the Chinese place less importance on leisure than European North Americans as discussed previously. However, contrary to the stereotypical understandings that immigrants, especially first generation immigrants, will exhibit significant difference in leisure behaviors because they tend to be subject to a broader range of leisure constraints than their dominant cultural society (Stodolska, 1998), the Chinese did not differ significantly in the behavioral component of leisure attitudes. This finding is further endorsed by their similar visitation patterns to national parks as noted earlier.

An explanation for the similarity in the behavioral component of leisure attitudes could be that the Chinese, especially the first generation immigrants, intend to participate in more leisure activities once leisure constraints such as income are successfully negotiated. As indicated, income was the fundamental factor that constrained the visitation frequencies to national parks for both groups, but particularly for the Chinese. As for immigrants, Horna (1980) states, they often strive "for positions based on the merits of their expertise and work performance and [are] willing to sacrifice a good deal of their leisure for additional studies and overtime work to compensate for their temporary inadequacies" (p. 101). Therefore, the more pressured they are for the time being, the more eagerly they will be for relaxation once released (cf. Hung, 2003). Consequently, among the Chinese, the actual leisure pursuit such as visitation to national parks could be significantly different among individuals with different levels of income, but their intentions to participate in leisure activities did not vary significantly. This proposition is substantiated by some of the comments made by the Chinese. For instance, four Chinese respondents indicated that earning more money to survive has prevented them from pursuing leisure activities with one of them noting that "Canada has a unique natural environment. [However], work and family prevent me from enjoying it." This finding is generally consistent with what was found by Hall and Rhyne (1989), who reported that the Chinese living in Ontario were more likely to mention having no time because of family than were Anglo-Canadians and others in pursuing their first favorite activities (25% of the Chinese mention this as compared to 13% of all others) or second favorite activities (30% as compared to 13% of others).

The discrepancies in perceptions of the cognitive and affective components versus behavioral component of leisure attitudes do not conflict. First, immigrants, especially new immigrants become familiar with their adopted societies by initially becoming familiarized with the physical environment, or physical acculturation (Berry & Sam, 1997). Second, it may be assumed that one may like a leisure activity and experience but still place less value on it. For instance, one may find watching TV interesting, but place little value on it (Mannell & Kleiber, 1997). Inferred by this argument, similarities in leisure behaviors or intended behaviors do not lead to similarities in cognitive or affective dimensions of leisure, and vice versa. That is, the Chinese may pursue leisure activities as frequently as their Anglo-Canadian counterparts, they may still place less value on them.

Contrary to expectations, the level of acculturation did not influence leisure attitudes held by the Chinese. That is, the more acculturated Chinese did not exhibit similarities in attitudes toward leisure compared with Anglo-Canadians. Specifically, the less acculturated Chinese, the more acculturated Chinese, and Anglo-Canadians did not differ significantly with one another with regard to the behavioral component of leisure attitudes. In addition, Anglo-Canadians were significantly different from the less acculturated Chinese (at the unadjusted Bonferroni level) and the more acculturated Chinese while the two Chinese subgroups were not significantly different from each other. It appears that ethnicity plays an important role in the affective and behavioral sub-scales, where acculturation did not affect the differences in the affective dimension or similarities in the behavioral sub-scale that already existed between the two groups.

It should be noted that the difference in the affective scores between the high acculturated Chinese and Anglo-Canadians was significantly greater than that between the less acculturated Chinese and Anglo-Canadians. Regression analysis of acculturation on sex, age, education, income, and length of residence indicated that those who are highly acculturated tend to be younger, well-educated or have resided in Canada longer. Although these factors could act on acculturation simultaneously, that is, a younger person who was well-educated with a longer length of residence in Canada was easily acculturated. However, it could be one of these factors that attributed to acculturation. It appears that education is the most important factor in affecting Chinese respondents' attitudes toward the affective dimension of leisure attitudes. The regression analyses indicated, those who were more educated held negative feelings about leisure than those who were less educated. It should be noted that those who were well-educated were those who were highly acculturated. Therefore, it would appear that education is largely responsible to the differences in attitudes toward the affective aspect of leisure attitudes between the two groups.

This finding also suggests that the effect of acculturation on the affective domain of leisure attitudes could be mediated through education. It is noteworthy that education is highly respected in Chinese society, and a higher level of education is usually linked to higher level of achievement, which requires hard working and less play, according to Chinese tradition (Neumeyer & Neumeyer, 1936; Ap, 2002). Therefore, it is understandable that those with higher level of education were less likely to endorse leisure attitudes in the affective domain.

The above explanations could also apply to the differences in cognitive dimension of leisure attitudes. It was found that, among Chinese respondents, education was also negatively related to cognitive aspect of leisure attitudes although the relationship was not significant.

When the two groups were separately examined, it was found they did share a great of similarities. First, for both groups, correlation between affective and behavioral scales was greater than that between cognitive and behavioral. This suggested that behavioral intentions may be caused more by what is felt than by what is known about leisure activities. Previous studies also found that the cognitive and affective components of leisure attitudes differed in the degree of effect each had on motivation, with the latter having the greater significance than the former (Hsieh, 1998; Ragheb & Tate, 1993). Moreover, only approximately one-third of the true variance of the sub-scales is common among them, suggesting that the three sub-scales measure different traits of leisure attitudes. This finding further endorsed previous argument that leisure attitudes should be examined from the three components (Hsieh, 1998; Ragheb & Beard, 1982; Ragheb & Tate, 1993). These two findings are highly consistent with Ragheb and Beard's (1982) findings, although, in their study, over 1,000 subjects were involved and all 36 items were used.

Second, each leisure sub-scale was positively related to visitation rates to national parks, implying that visitation to national parks could enhance individuals' attitudes toward leisure or vice versa. This finding is consistent with what was found by Nichols and Fines (1995) that outdoor recreation activities can positively enhance leisure attitudes. However, while both groups were not significantly related to national park visitation with regard to the cognitive dimension, Anglo-Canadians were significantly related to the affective and behavioral scores but the Chinese were not. The finding with regard to Anglo-Canadians indicated that outdoor recreation participation such as visiting national parks was closely related to the affective and behavioral sub-scales rather than the cognitive sub-scale. A similar finding was reported by Nichols and Fines (1995) that the mean scores of the two components of leisure attitudes--affective and behavioral--were significantly different between before- and after-outdoor recreation activities while the increase in the mean score for the cognitive component was insignificant before and after participation.

Third, the relationship patterns of national park visitation to such variables as sex, age, education, and income were exactly the same for both groups, with income being the most significant factor that constrains the frequency of visit to national parks. In addition, males, the younger, and well-educated tend to have visited national parks more often than females, the older and less educated. In the case of the Chinese, those who were more acculturated tend to have visited national parks more frequently than those who were less acculturated. However, the relationship of national park visitation to acculturation was not significant. This finding is consistent with Hung's (2002) finding with regard to Chinese immigrants living in Vancouver.

Fourth, attitudes toward leisure were generally homogenous within each group, particularly among Anglo-Canadians. For instance, for Anglo-Canadians, sex, age, education, and income were not significantly related to the cognitive and affective sub-scales while only income was significantly related to the behavioral scores. For the Chinese, the four variables were not significantly related to the cognitive and behavioral sub-scales while only education was significantly related to the affective dimension. In addition, regression analyses indicated there were no significant differences in leisure attitudes among different levels of acculturation among the Chinese.

Finally, the majority of respondents in each group held positive attitudes toward leisure although attitudes toward leisure held by the Chinese were less positive as compared with Anglo-Canadians. For instance, of the 24 items, a majority of them (21 items) had the highest frequency of responses in either the "mildly agree" or "strongly agree" category, indicating that both groups hold positive attitudes toward leisure. In addition, both groups have the same two items (i.e., "Leisure pursuits contribute to one's health" and "People need leisure pursuits") among the top three responses in the category of "strongly agree" and the same one item5 (i.e., "I feel guilty about enjoying myself") that was "strongly disagreed" by them. Therefore, when the Chinese are less positive in leisure attitudes compared with Anglo-Canadians, the majority of the Chinese may nevertheless hold positive attitudes toward leisure. For instance, some Chinese respondents emphasized the importance of balancing leisure and work with one of them stating that:

> We should enjoy our leisure activities as far as possible. Moderate leisure activities can enhance our well-being, improve our working efficiency. It was said it is good to balance work and rest.

CHAPTER SIX

CONCLUSIONS

Cross-cultural comparative studies on national parks, the environment, and/or leisure involving ethnicity are rare. This observation is particularly the case for Chinese. Moreover, previous studies specifically involving leisure and natural resources have paid very limited attention to perceptions, values, and needs of subgroups within populations (Sasidharan, 2002). To date, no study has been conducted to examine similarities and differences in attitudes toward national parks, the environment, and leisure from the perspective of acculturation, although the importance of acculturation in these three areas has been recognized by a number of researchers. For example, Stodolska (2000) has argued that: "there has been no systematic effort to address the issue of immigration-induced changes in leisure" (p. 40). Similarly, Juniu (2000) has stated that: "the degree of assimilation of a group is a meaningful factor to describe the effects in the type of their leisure constraints and recreation activities" (p. 363). Additionally, Floyd (2001) suggests that studies should utilize acculturation to examine attitudes of a minority group toward national parks. Finally, and more recently, Leung and Rice (2002) implied that the differences between Chinese Australians and Anglo Australians in regards to the New Environmental Paradigm (NEP), environmental concern, and environmental behaviors could be explained more explicitly by acculturation.

In response to the above concerns, the present study was conducted using the acculturation thesis and the proposition that, as a person becomes more acculturated, his or her attitudes, preferences, and behaviors become closer to those found in the new culture. In order to test such a thesis in relation to national parks, the environment, and leisure, this study used MANCOVA/ANACOVA and/or following pairwise comparisons with three covariates (i.e., age, education, and income) to examine similarities and differences in attitudes toward the three sub-areas, first from the perspective of ethnicity and then from the perspective of acculturation.

The results indicate that ethnicity is a more important factor than acculturation when the attitudes held by the Chinese and Anglo-Canadians toward national parks, the environment, and leisure are comparatively examined (Table 6-1). Table 6-1 provides a summary of the outcomes of the hypothesis examination. The corollary to this finding is that similarities and differences detected in this study with regards to the three study areas are largely a function of ethnicity. This finding is generally consistent with previous findings. For instance, in a review article, Allison (1988) concluded that empirical evidence supports the ethnicity thesis, which "attributes differences in recreation behavior to value differences based on subcultural norms" (Johnson et al., 1998, p. 102). More recently, Gramann and Allison (1999) also indicated that among studies that tested the marginality-ethnicity framework, most research favors the ethnicity thesis.

The results also indicate that the Chinese adopted a process of selective acculturation, in that they become more "Anglo-like" in their attitudes toward some aspects of the three areas as they become more assimilated into Anglo-Canadian society, but they maintain their "traditional" attitudes toward many other aspects of the studied areas. In addition, acculturation does not always act in anticipated direction, in that the higher acculturated Chinese are significantly different from Anglo-Canadians in their attitudes toward some aspects of the three areas, while the lower acculturated Chinese are not. This paradox can be explained in relation to the socio-demographic characteristics, rather than acculturation per se (cf. Gramann et al., 1993).

Table 6-1

Summary of Outcomes of Hypothesis Examination

Hypotheses	Sub-scales	Supported or not	
		Ethnicity	Acculturation
H1: There exist significant differences in attitudes toward the revised policy of national parks between Chinese in Canada and Anglo-Canadians	Priority on ecological integrity	Yes	
	Compromise between use and protection	Yes	
H2: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the revised policy of Canadian national parks	Priority on ecological integrity		No
	Compromise between use and protection		No
H3: There exist significant differences in attitudes toward the roles and functions of national parks between Chinese in Canada and Anglo-Canadians.	Ecological integrity	No	
	Non-market values	Yes	
	Leisure opportunities	No	

(*Table continues*)

Table 6-1. (*continued*)

Hypotheses	Sub-scales	Supported or not	
		Ethnicity	Acculturation
H4: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of the roles and functions of Canadian national parks	Ecological integrity		No
	Non-market values		No
	Leisure opportunities		No
H5: There exist significant differences in attitudes toward appropriate use of Canada's national parks between Chinese in Canada and Anglo-Canadians	Accommodation and service facilities	Yes	
	Non-consumptive activities	Yes	
	Sport/recreation facilities	No	
	Motorized activities	Yes	
	Consumptive activities	Yes	
	Visitor facilities	No	

(*Table continues*)

Table 6-1. (*continued*)

Hypotheses	Sub-scales	Supported or not	
		Ethnicity	Acculturation
H6: The more acculturated a Chinese person is, the more likely he or she will share similar attitudes with those held by Anglo-Canadians in terms of appropriate use within Canadian national parks	Accommodation and service facilities		Yes
	Non-consumptive activities		No
	Sport/recreation facilities		No
	Motorized activities		No
	Consumptive activities		Yes
	Visitor facilities		No
H7: There exist significant differences in environmental values between Chinese in Canada and Anglo Canadians.	Social-altrustic value orientation	Yes	
	Biospheric value orientation	No	
H8: The more acculturated Chinese are, the more similar their environmental values will be to those of Anglo-Canadians	Social-altrustic value orientation		Yes
	Biospheric value orientation		No

(*Table continues*)

Table 6-1. (*continued*)

Hypotheses	Sub-scales	Supported or not	
		Ethnicity	Acculturation
H9: The less acculturated a Chinese, the higher retention of his or her traditional values.			No
H10: There exist significant differences in attitudes toward the environment between Chinese in Canada and Anglo-Canadians	Ecocrisis	No	
	Limits to growth	Yes	
	Anti-anthropocentrism	Yes	
	Balance-of-nature	No	
H11: The more acculturated Chinese are, the more likely their environmental attitudes will be similar to those of Anglo-Canadians	Ecocrisis		No
	Limits to growth		No
	Anti-anthropocentrism		Yes
	Balance-of-nature		No

(*Table continues*)

Table 6-1. (*continued*)

Hypotheses	Sub-scales	Supported or not	
		Ethnicity	Acculturation
H12: There exist significant differences in leisure attitudes between Chinese in Canada and Anglo-Canadians	Cognitive	Yes	
	Behavioral	No	
	Affective	Yes	
H13: The greater level of acculturation a Chinese person has, the more likely his or her leisure attitudes will be similar to those of Anglo-Canadians.	Cognitive		No
	Behavioral		No
	Affective		No
H14: Leisure attitudes held by Anglo-Canadians are more positively valued than is the case of Chinese in Canada		Yes	

The above findings indicate that acculturation cannot be taken for granted when explaining a difference between majority members and minority members. Acculturation should be combined with subjects' knowledge and experience of a given object. Furthermore, it should be kept in mind that any measurement of acculturation cannot embrace all aspects of cultural traits that are found in different cultures (Hunt, 1999). Therefore, some cultural traits included in a measurement cannot be used to explain those phenomena that are not related to them. In fact, acculturation could be mediated by some other factors such as age, income, length of residence, etc., which can "serve as potential rival explanation of any obtained relationships between them and adaptation" (Dion & Dion, 1996, p. 460).

Summaries

1. In the case of national parks, the Chinese tend to be less likely supportive of Park's Canada's policy of placing priority on ecological integrity by limiting the number of visitors, phasing out inappropriate uses, and restricting the provision of recreational activities. In addition, Chinese tend to be less likely to endorse the non-market values of national parks. However, Chinese share similar attitudes toward national parks' roles and functions as places for the protection of ecological integrity as well as for the settings and provision of leisure opportunities. Moreover, they consider those activities that are familiar to them (i.e., gathering edible products, fishing, hunting) to be more appropriate or as appropriate as (taking picture, watching wildlife, etc.) those considered appropriate by Anglo-Canadians. However, those activities (i.e., sightseeing by car, rock climbing) that are different from their recreational tradition are considered to be inappropriate. The

similarities and differences can also be explained by their past experiences, emotional/symbolic attachment, and the self-interests thesis.

2. In the case of environmental values and attitudes, the Chinese tend to support social altruism more than Anglo-Canadians but hold perceptions similar to Anglo-Canadians with regard to the biospheric domain of environmental values. These differences could be explained by collectivism and Confucianism, both of which are characteristics of the Chinese culture. While the both groups are not significantly different from each other in two of the four aspects of the NEP--ecocrisis and balance-of-nature, the Chinese are significantly less likely than Anglo-Canadians to endorse the other two aspects of the NEP--limits to growth and anti-anthropocentrism. These differences suggest that the Chinese are more supportive of growth and development and less supportive of anti-anthropocentrism, which seemingly contradicts what is traditionally believed about Chinese and their relationship to nature.

3. In the case of leisure attitudes, and consistent with what have been reported in the past, the attitudes held by the Chinese toward leisure are generally negative in comparison with those held by Anglo-Canadians. This is particularly true in terms of cognitive and affective dimensions of leisure attitudes. Contrary to the stereotypical view that immigrants are largely constrained in leisure behaviors, this study found that the intentional behaviors reported by the Chinese are similar to those reported by Anglo-Canadians. On one hand, this suggests that physical acculturation tends to occur initially, and is followed by belief or value acculturation. On the other, it could also be explained by the fact that the Chinese suffering from the pressures of survival are more eager to have leisure pursuits once the opportunity arises.

4. Attitudes held by Anglo-Canadians and the Chinese toward national parks, the environment, and leisure tend to be homogenous within each group.

5. An interaction effect is more likely to occur between culture and sex than between culture and other variables, such as age, education, and income.

6. A causal path seems to exist among environmental values, the NEP, and national parks, in that while the two groups share similar biospheric values, they also share similar attitudes toward ecocrisis and balance-of-nature (i.e., the NEP), and ecological integrity (i.e., national park roles and functions). While the Chinese are more supportive of the social altruism, they are less supportive of non-market values (i.e., national park roles and functions), which are related to self-interests. The more collectivistic the Chinese are, the more likely that they are to focus on the interests of their in-groups, and therefore, they tend to be more concerned about what are close to them and less concerned about what are distant to them (Chan, 2001, Triandis, 1990; cited in Chan, 2001). Thus, they tend to less care about issues such as future generations, Canadian identity, global warming, which are distant, while caring about limits to growth which is more immediate to their daily existence.

7. Dunlap et al. (2000) argued that the NEP scale adopted in this study can be treated "as a single measure endorsement of an ecological worldview as opposed to creating two or more dimensions" (pp. 435-436). However, in terms of cross-cultural research, finding based on this treatment could cover the similarities that could exist between two or more groups. As found in this study, the two groups did not differ in all dimensions of the NEP. Therefore, the NEP should be factor analyzed into sub-scales instead of being considered as one single scale.

8. While sub-scale analysis is effective and parsimonious, it could still cover similarities or differences between groups in a number of items (see Hall & Rhyne, 1989, p. 136). For instance, mean scores for a number of items in the non-market values sub-scale between the two groups are quite close. If an analysis was made based on this sub-scale, the similarities in some of the items could be obscured. Therefore, in certain situations, an item specific analysis could be more useful than a sub-scale analysis.

Research Limitations and Future Research

As with any form of research, this study is not without limitations. First, the Chinese participants were deliberately chosen so as to avoid ethnic homogenization. However, as a majority of them were first generation immigrants and arrived in Canada 10 years ago or so, acculturation may not have occurred to the extent anticipated. Despite the possible limitation associated with a short length of residence, it should be noted that the general pattern of acculturation in this study is consistent with what has been found in other studies, in that acculturation was significantly negatively related to age and was significantly positively related to education and length of residence/ethnic identity/generation status. Although the response pattern by Chinese from mainland China in Edmonton is reflective of the real situation in Edmonton, Chinese in other Chinese-concentrated communities (e.g., Vancouver, Toronto) may have resided in those cities for a longer time period. In such situations, acculturation may be more important. Moreover, Chinese in these major cities are often more diverse in terms of origin and occupation, thus allowing future comparisons among Chinese sub-groups to be possible. Second, occupation could also be a factor that influences people's attitudes toward national parks, the environment, and leisure. Most of the Chinese study participants were highly educated, as shown by the large percentage (46.3%) that indicated that they had graduate degrees. Furthermore, many of these individuals may have had occupations in engineering, computer sciences, physics, etc., and this could potentially have affected their attitudes. Unfortunately, because participants' occupations were not examined it remains unknown what effect, if any, occupation may have had. Third, Chinese respondents were more likely to choose the middle and less likely to choose extremes along a spectrum of choices. One alternative for dealing with this response bias is to standardize the raw scores (Vijver & Leung, 1997). While the standardization of the raw variables may reduce the cultural difference due to response biases, it could result in underestimating the real difference across groups when the difference is valid. Moreover, there is no justification that there exists difference due to such response biases (Vijver & Leung, 1997). Likewise, raw scores could create difference across cultural groups if the difference is due to response biases. Yang (2002) argues that it is difficult to determine, in a given study, that Chinese respondents do not report their real intentions. Hopefully, if a difference due to response biases does exist between both groups, the Bonferroni approach adopted in this study can eliminate such a difference by increasing the possibility of rejecting the null hypotheses. Finally, although the statistical methods used in this study are appropriate, unequal sample sizes used in the data analyses may increase the probability of a Type I error. However, this risk can be reduced by the unweighted-means approach adopted in this study (Tabachnick & Fidell, 1996).

On the basis of this study it is possible to suggest that future research in this area could focus on the three following areas.

1. The concept of leisure is largely of Western origin. Generally, specific terms that exactly match “leisure” in non-Western languages do not occur (Chick, 1987, cited in Yeh, 1993). For example, at least six different Chinese terms have been used by leisure

researchers as noted earlier. When asked for scoring on leisure attitudes, researchers do not know if leisure from the perspective of the Chinese is the same as from the perspective of Anglo-Canadians. Therefore, it appears necessary to examine what leisure is and what leisure means from both groups' perspectives.

2. In many respects, an understanding of differences in leisure attitudes across cultures is more challenging than is an understanding of leisure definitions. When conceptions of leisure are generally categorized into three dimensions--leisure as free time, activity, and a state of existence or state of mind--the objectives that leisure attitudes are oriented toward could be both extremely numerous and diverse. In this sense, to measure general leisure attitudes is insufficient to uncover the whole leisure domain, though it is not without certain merits. Rather, an understanding of situation centered leisure attitudes between cultures would be more helpful in trying to understand cross-cultural differences. Thus, in order to make the study of leisure attitudes more practical, measurement of specific situations would be more meaningful, as suggested by Holt's (2001) comment that: "in order to understand the meaning of leisure in people's lives it is necessary to be concerned with the attitudes and perceptions surrounding a particular situation" (para. 1).

3. In terms of cross-cultural comparisons, it should be kept in mind that findings based on immigrants in their adopted society do not necessarily represent the findings that would be found in their host society. Theoretically, the examination of national parks, the environment, and leisure between the two groups in separate societies would be more effective and straightforward than studies involving immigrants, as findings in the latter case are often affected by other interacting variables such as acculturation,

occupation, income, family issues, and culturally-related constraints. Triandis (1972) saw this type of research as "Pseudoetic", rather than "etic" (cited in Yang, 1986). According to Yang (1986), "any cross-cultural differences found in this type of study should be interpreted with special caution" (p. 108). In order to reveal the whole picture of attitudes in the three areas, a study with three samples--Anglo-Canadians, Chinese in Canada and Chinese in mainland China--could be effective in understanding the dynamic patterns of attitudes and the functions of acculturation. Finally, future research may try to examine the cause-effect relationship among the three areas by conducting path analysis.

The relationship between leisure/outdoor recreation and environmental awareness/attitudes has been investigated theoretically and empirically in many previous studies (see Burger, 2001; Cottrell, 2003; Dunlap & Heffernan, 1975; Geisler, Maartinson & Wilkening, 1977; Hanna, 1995; Nord, Luloff & Bridger, 1998; McCool & Lime, 1988; Jackson, 1986, 1987; Palmberg & Kuru, 2000; Tarrant & Green, 1999; Van Liere & Noe, 1981). In addition, Noe and Snow (1990) argued that "the national parks offered a unique opportunity for evaluating the degree to which environmental concern influences the public's perceptions of nature" (p. 21). More recently, Eagles and McCool (2002) stated that "parks can contribute to furthering [environmental] education and provide a lasting impression by offering programmes for both children and adults that focus on environmental issues" (p. 45). However, to date, no such a study that has been conducted to try to examine empirically the relationships among the three areas.

Applied Implications

As indicated in this study, the two groups--Anglo-Canadians and the Chinese generally hold positive attitudes toward national parks. They realized the primary role of national parks is for protection of ecological integrity and the majority of them supported Parks Canada's policy on placing first priority on the protection of park resources and environments. This finding could be helpful for Parks Canada to take more stringent measures in the benefits of the protection of ecological integrity.

In the meanwhile, Parks Canada should provide more information about Canada's national parks for the public and make the information more accessible to them, especially the minority groups such as the Chinese. As found in this study, 5% Anglo-Canadian respondents and 13% Chinese respondents mixed national parks with other parks. Moreover, during the advance phone calls, 2.8% Chinese participants even did not know what national parks refer to.

In addition, Parks Canada needs to raise the public's awareness of national parks if they hope to seek more support from them. During the advance phone calls, it was found that 28.7% Anglo participants and 6.2% Chinese participants reported they were not interested in the study topic.

According to Eagles and McCool (2002), "cross-cultural programming will need to be more frequent in parks. Providing a mix of services, facilities and opportunties that pleases a diverse group of park users will be a challenge…this has important implications for information provision in the parks. There needs to be a greater emphasis on basic information, park locations, rules, advanced reservations and recreational opportunities" (p. 44). Obviously, the Chinese tend to be less aware of Canada's national parks than their Anglo-Canadian counterparts. Although the lack of awareness could be related to the lack of a sense of place or identity, or other constraints such as education and income, lack of information and understanding about Canada's national parks could also be an important factor. In view of this, Parks Canada could enhance this group's awareness of national parks through the provision of the biligual versions of information involving the management, operation, and policy of Parks Canada.

Overall, attitudes toward national parks held by the majority of Anglo-Canadians and Chinese respondents were positive. The strong attitudes toward national parks can provide the incentive for political action toward parks (Eagles & McCool, 2002). "Only when sufficiently large numbers of people gain such attitudes and take such actions does government see the need to move" to have more resources being appropriated to national parks (Eagles & McCool, 2002, p. 23).

In conclusion, this study examined the attitudes held by the Chinese in Canada toward national parks, the environment, and leisure in comparison with those held by Anglo-Canadians. As such, it represents one of the first steps in trying to understand how attitudes toward these three areas differ between the two groups, and among less acculturated Chinese, high acculturated Chinese, and Anglo-Canadians.

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Appendix A. The IUCN Protected Area Management Categories

Category Ia: Strict Nature Reserve: protected area managed mainly for science

Category Ib: Wilderness Area: protected area managed mainly for wilderness protection

Category II: National Park: protected area managed mainly for ecosystem protection and recreation.

Category III: Natural Monument: protected area managed mainly for conservation of specific natural features.

Category IV: Habitat/Species Management Area: protected area managed mainly for conservation through management intervention

Category V: Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation

Category VI: Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems.

Source: IUCN (1994).

Appendix B. Method of Identifying Potential Participants-Anglo-Canadians

Surname	Page	Number	Systematic Sampling	Sampling Size	Starting Number	Others
Smith	955-960	1889	Every 157th	12	22nd	
Jones	505-507	696	58th	12	74th	
Williams	1109-1111	726	61st	12	85th	
Brown	130-133	991	83rd	12	79th	
Taylor	1012-1014	712	60th	12	60th	
Davies	245	201	17th	12	45th	
Wilson	1113-1115	840	70th	12	69th	
Evans	313-314	297	25th	12	23rd	
Thomas	1023-1024	466	39th	12	34th	
Johnson	500-503	1134	95th	12	77th	
Roberts	868-869	274	23rd	12	18th	
Walker	1079-1080	446	37th	12	75th	
Wright	1129-1130	324	27th	12	44th	
Robinson	870-872	472	40th	12	51st	
Thompson	1024-1026	648	54th	12	17th	
White	1102-1103	529	44th	12	87th	
Hughes	468	246	21st	12	19th	
Edwards	298-299	281	24th	12	45th	
Green	395-396	243	21st	12	55th	
Hall	412-413	316	27th	12	71st	
Wood	1124-1125	321	27th	12	37th	
Harris	423-424	298	25th	12	95th	
Lewis	598-599	284	24th	12	20th	
Martin	652-653	566	47th	12	61st	
Jackson	487-488	334	28th	12	27th	
Clarke	201-202	326	27th	12	16th	

(*Table continues*)

Appendix B. (*continued*)

Surname	Page	Number	Systematic Sampling	Sampling Size	Starting Number	Others
Clark	199-201	460	39th	12	94th	
Turner	1049	302	25th	12	45th	
Hill	445-446	269	23rd	12	36th	
Scott	919-921	496	42nd	12	77th	
Cooper	216-217	244	21st	12	16th	
Morris	718-719	215	18th	12	84th	
Ward	1083-1084	260	22nd	12	70th	
Moore	714-715	362	30th	12	73rd	
King	531-533	383	32nd	12	12th	
Watson	1087-1088	304	26th	12	97th	
Baker	59-60	281	24th	12	52nd	
Harrison	424-425	228	19th	12	51st	
Morgan	716	156	13th	12	16th	
Patel	788-789	115	10th	12	35th	
Young	1138-1139	483	41st	12	95th	
Allen	24-25	306	26th	12	95th	
Mitchell	706-708	498	42nd	12	44th	
James	489-490	237	20th	12	52nd	
Anderson	31-34	1079	90th	12	25th	
Phillips	807	263	22nd	12	44th	
Lee	586-589	741	62nd	12	30th	
Bell	80-81	303	26th	12	97th	
Parker	784-785	220	19th	12	41st	
Davis	245-246	338	28th	12	49th	
Total		**22,403**		**600**		

Appendix C. List of Potential Chinese Participants by Surname

No.	Surname				
	Character	Hanyu pinyin	Number		Page
1	安	An	8(2)[a]	8(2)[b]	p.31
2	白, 柏,	Bai	5(2)	13(4)	p.57
3	保, 鲍, 暴	Bao	4(2)	17(6)	p.64
4	蔡	Cai	12(0)	29(6)	p.149
5	苍	Cang	3(2)	32(8)	p.160
6	曹	Cao	31(2)	63(10)	p.161
7	柴	Chai	16(0)	79(10)	p.176
8	常, 昌	Chang	76(17)	155(27)	p.180
9	车	Che	4(0)	159(27)	p.183
10	陈	Chen	180(11)	339(38)	pp.184-185
11	成, 盛, 程	Cheng	114(38)	453(76)	p.185
12	池	Chi	10(1)	463(77)	p.187
13	褚, 储	Chu	106(22)	569(99)	pp.195-196
14	崔	Cui	11(2)	580(101)	p.231
15	戴	Dai	4(0)	584(101)	p.238
16	邓	Deng	19(0)	603(101)	p.254
17	荻, 邸	Di	2(0)	605(101)	p.262
18	刁	Diao	1(0)	606(101)	p.263
19	丁	Ding	10(2)	616(103)	p.266
20	董	Dong	21(4)	637(107)	p.278
21	杜, 都	Du	24(1)	661(108)	p.279
22	段	Duan	3(1)	664(109)	p.279

(*Table continues*)

Appendix C. (*continued*)

No.	Surname				
	Character	Hanyu pinyin	Number		Page
23	范, 樊	Fan	20(3)	684(112)	p.320
24	方, 房	Fang	10(0)	694(112)	p.320
25	费	Fei	5(2)	699(114)	p.325
26	冯, 凤, 酆, 封	Feng	10(0)	709(114)	p.325
27	傅, 伏, 富, 符	Fu	20(1)	729(115)	p.353
28	干, 甘	Gan	5(1)	734(116)	p.361
29	高, 郜	Gao	15(0)	749(116)	p.362
30	葛, 戈, 盖	Ge	2(0)	751(116)	p.367
31	巩, 龚, 弓, 宫	Gong	10(0)	761(116)	p.384
32	古, 谷, 顾	Gu	10(1)	771(117)	p.403
33	关, 管	Guan	10(1)	781(118)	p.403
34	广	Guang	1(0)	782(118)	p.403
35	郭, 国	Guo	20(1)	802(119)	p.405
36	杭	Hang	3(0)	805(119)	p.417
37	郝	Hao	8(0)	813(119)	p.420
38	何, 贺, 和	He	17(2)	830(121)	p.432
39	洪	Hong	28(5)	858(126)	p.458
40	侯	Hou	2(0)	860(126)	p.462
41	胡	Hu	27(1)	887(127)	pp.465-466
42	华, 花, 滑	Hua	19(0)	906(127)	p.466
43	桓	Huan	1(0)	907(127)	p.466
44	黄	Huang	93(2)	1000(129)	p.466
45	霍	Huo	3(0)	1003(129)	p.472

(*Table continues*)

Appendix C. (*continued*)

No.	Surname				
	Character	Hanyu pinyin	Number		Page
46	计, 纪, 季, 吉, 稽, 汲, 蓟, 籍	Ji	5(0)	1008(129)	p.498
47	贾, 家	Jia	2(0)	1010(129)	p.465
48	江, 姜, 蒋	Jiang	20(0)	1030(129)	p.498
49	焦	Jiao	3(0)	1033(129)	p.498
50	金, 靳	Jin	12(2)	1045(131)	p.498
51	康	Kang	41(10)	1086(141)	pp.514-515
52	孔	Kong	32(7)	1118(148)	p.545
53	赖	Lai	78(16)	1196(164)	p.567
54	蓝	Lan	11(0)	1207(164)	p.571
55	乐	Le	154(2)	1361(166)	p.583
56	雷	Lei	18(0)	1379(166)	p.590
57	李, 历, 黎, 郦	Li	253(29)	1632(195)	pp.599-600
58	廉, 连	Lian	1(0)	1633(195)	p.600
59	梁	Liang	29(2)	1662(197)	p.600
60	廖	Liao	7(3)	1669(200)	p.600
61	林, 蔺	Lin	80(13)	1749(213)	pp.602-603
62	凌	Ling	31(9)	1780(222)	p.604
63	刘, 柳	Liu	127(20)	1907(242)	pp.606-607
64	娄	Lou	12(2)	1919(244)	p.614
65	陆, 卢, 鲁, 吕, 路	Lu	64(4)	1983(248)	p.616
66	栾	Luan	3(0)	1986(248)	p.616
67	罗, 骆	Luo	10(0)	1996(248)	p.619

(*Table continues*)

Appendix C. (*continued*)

No.	Surname				
	Character	Hanyu pinyin	Number		Page
68	马, 麻	Ma	167(16)	2163(264)	pp.623-624
69	麦	Mai	8(2)	2171(266)	p.638
70	梅	Mei	4(0)	2175(266)	p.688
71	孟, 蒙	Meng	6(0)	2181(266)	p.691
72	米, 糜, 宓	Mi	1(0)	2182(266)	p.695
73	苗, 缪	Miao	2(0)	2184(266)	p.695
74	闵	Min	7(1)	2191(267)	p.704
75	明	Ming	1(0)	2192(267)	p.704
76	莫	Mo	11(1)	2203(268)	p.708
77	穆, 牧	Mu	4(0)	2207(268)	p.723
78	宁	Ning	1(0)	2208(268)	p.748
79	欧	Ou	8(0)	2216(268)	p.773
80	潘	Pan	20(4)	2236(272)	pp.779-780
81	庞	Pang	23(9)	2259(281)	p.780
82	裴	Pei	2(1)	2261(282)	p.796
83	彭, 蓬	Peng	10(2)	2271(284)	p.797
84	皮	Pi	2(0)	2273(284)	p.808
85	齐, 启, 戚, 祁	Qi	8(1)	2281(285)	p.837
86	钱	Qian	2(0)	2283(285)	p.837
87	强	Qiang	3(0)	2286(285)	p.837
88	乔	Qiao	4(0)	2290(285)	p.837
89	秦	Qin	6(0)	2296(285)	p.837
90	邱, 裘, 秋, 仇	Qiu	10(1)	2306(286)	p.837

(*Table continues*)

Appendix C. (*continued*)

No.	Surname				
	Character	Hanyu pinyin	Number		Page
91	曲, 屈, 麹, 璩, 瞿	Qu	4(0)	2310(286)	p.837
92	全	Quan	21(5)	2331(291)	pp.837-838
93	饶	Rao	14(4)	2345(295)	p.846
94	任	Ren	4(0)	2349(295)	p.857
95	荣, 戎	Rong	1(0)	2350(295)	p.877
96	沙	Sha	3(1)	2353(296)	p.929
97	邵, 韶	Shao	7(1)	2360(297)	p.931
98	单, 山	Shan	4(0)	2364(297)	p.930
99	尚	Shang	1(0)	2365(297)	p.930
100	沈, 申	Shen	13(5)	2378(302)	p.935
101	盛	Sheng	1(0)	2379(302)	p.935
102	石, 师, 史, 时	Shi	14(2)	2393(304)	p.937
103	舒, 束	Shu	6(1)	2399(305)	p.940
104	水	Shui	1(0)	2400(305)	p.941
105	司	Si	5(0)	2405(305)	p.942
106	宋, 松	Song	36(5)	2441(310)	p.965
107	孙	Sun	9(0)	2450(310)	p.997
108	邰	Tai	12(5)	2462(315)	p.1007
109	谈, 谭	Tan	86(20)	2548(335)	p.1009
110	汤, 唐	Tang	156(9)	2704(344)	p.1010
111	陶	Tao	11(2)	2715(346)	p.1010
112	田	Tian	10(3)	2725(349)	p.1028
113	童	Tong	54(15)	2779(364)	pp.1034-1035
114	万	Wan	34(15)	2813(379)	p.1082

(*Table continues*)

Appendix C. (*continued*)

No.	Surname				
	Character	Hanyu pinyin	Number		Page
115	王, 汪	Wang	135(6)	2948(385)	pp.1082-1083
116	卫, 魏, 韦, 危	Wei	14(1)	2962(386)	p.1092
117	闻, 文	Wen	6(0)	2968(386)	p.1095
118	吴, 邬, 伍, 吴, 巫, 武	Wu	111(18)	3079(404)	p.1130
119	席, 奚, 郗	Xi	1(0)	3080(404)	p.1132
120	夏	Xia	3(0)	3083(404)	p.1132
121	向, 项	Xiang	2(0)	3085(404)	p.1132
122	萧, 肖	Xiao	10(0)	3095(404)	p.1132
123	谢, 解	Xie	10(1)	3105(405)	p.1132
124	邢, 幸	Xing	2(1)	3107(406)	p.1132
125	熊	Xiong	2(0)	3109(406)	p.1132
126	许, 徐, 胥	Xu	54(3)	3163(409)	p.1132
127	宣	Xuan	1(0)	3164(409)	p.1132
128	薛	Xue	4(0)	3168(409)	p.1132
129	严, 颜, 燕, 阎	Yan	31(6)	3199(415)	p.1133
130	杨, 羊, 仰	Yang	74(8)	3273(423)	p.1134
131	姚	Yao	6(2)	3279(425)	p.1134
132	叶	Ye	8(0)	3287(425)	p.1135
133	易, 羿, 伊	Yi	7(1)	3294(426)	p.1137
134	尹, 殷, 印, 阴	Yin	12(0)	3306(426)	p.1137
135	应	Ying	9(3)	3315(429)	p.1137
136	雍	Yong	29(13)	3344(442)	p.1137

(*Table continues*)

Appendix C. (*continued*)

No.	Surname				
	Character	Hanyu pinyin	Number		Page
137	尢, 游	You	4(1)	3348(443)	p.1138
138	于, 余, 虞, 喻, 俞, 郁, 禹, 於, 庾	Yu	173(32)	3521(475)	p.1140
139	袁	Yuan	9(0)	3530(475)	p.1140
140	曾	Zeng	9(0)	3539(475)	p.1145
141	赵	Zhao	35(0)	3574(475)	p.1145
142	张, 章	Zhang	114(0)	3688(475)	p.1145
143	甄	Zhen	1(0)	3689(475)	p.1145
144	郑	Zheng	14(0)	3703(475)	p.1145
145	钟, 仲	Zhong	7(0)	3710(475)	pp.1145-1146
146	周	Zhou	37(0)	3747(475)	p.1146
147	朱, 祝, 诸, 竺	Zhu	34(2)	3781(477)	p.1146
148	邹	Zou	3(0)	3784(477)	p.1148
149	左	Zuo	3(0)	3787(477)	p.1149
Total			**3787(477)**		

Note. [a] Number in parentheses refers to those Chinese whose surnames are spelled in Hanyu pinyin, while given names in English. [b] Numbers are accumulated.

Appendix D. Advance Phone Call

English Version

Hello, my name is_________ from the University of Alberta. We are conducting a survey about attitudes toward national parks, the environment, and leisure. This is strictly a graduate research project. I would like to ask you to participate this study and to help us out. If you are willing to participate, a questionnaire and other necessary documents will be mailed to you in a couple of days. It will take you less than 30 minutes to fill out the questionnaire. Your answers are confidential and your anonymity is assured.

Are you willing to?

Scenario A:

[If yes], which ethnic or cultural group(s) do you belong to?

[If the answer if either of the following: British, English, Scottish, Walsh, Irish, or Canadian], I am going to confirm your mailing address now, you are living at_______, and the postcode is_______. Thank you very much for your time and cooperation. Good-bye.

[If no], Thank you for taking my call. Good-bye.

Scenario B:

[If the respondent sounds like a teenager], are you 18 years old?

[If no], may I speak to your parents or other your family members who are over 18 years old?

[If yes, repeat Scenario A].

Scenario C:

[If the respondent is busy at the moment, make a time for next call].

Scenario D:

[If no one answers the phone, call later or next time and repeat A or B].

Chinese Version (Mandarin)

您好！请问您是_____先生/_____女士吗？我叫_______，是阿尔佰塔大学的研究生。我们要进行一项有关国家公园，环境，及休闲态度的调查研究。这一研究的主要目的是要了解在加拿大的中国人和英裔加拿大人在上述三个方面的态度有何差异。这纯为一研究生课题研究。我想请您帮忙参预这项研究。您的参预非常重要。如果您愿意参预，我们将随后寄给您一份调查表和其它资料。填好一份调查表不会超过30分钟。您所提供的信息完全保密。

请问，您可以参加这项研究吗？

情形 A:

[如果是]，您来自中国大陆吗？

[如果是]，我要确认您的邮寄地址，您住在__________, 邮编________。谢谢您的时间和合作，再见。

[如果否]，谢谢，再见。

情形 B:

[如果对方听声音象未成年人], 你今年有16岁吗?

[如果否], 我能请你父母接电话或年满16岁的哥哥或姐姐接电话吗?

[如果是, 重复情形 A].

情形 C:

[如果受访者当时没空， 则约好下次打电话的时间] 。

情形 D:

[如果没人接电话， 稍好或下次再拨， 并重复情形 A或情形 B] 。

Appendix E. Cover and Information Letter, Informed Consent Form, and Follow-up Letter (Cover and Information Letter)

Date

Jinyang Deng, Doctoral Candidate
Faculty of Physical Education and Recreation
University of Alberta, Edmonton, Alberta, Canada T6G 2H9
Tel: (780) 424-3629 E-mail: jinyang@ualberta.ca

Dear Sir or Madam:

A few days ago, we called you to request your participation in a graduate study project titled "Attitudes toward National Parks, the Environment, and Leisure: A Comparison between Chinese in Canada and Anglo-Canadians." Thank you once again for your willingness to be involved in this study.

The purpose of this study is to learn more about the similarities and differences in attitudes toward national parks, the environment, and leisure between Anglo-Canadians and Chinese in Canada. Cross-cultural research has become increasingly important because: (1) Canada is more ethnically diversified than ever, and (2) the increasing ethnic and racial diversity of Canada presents challenges and opportunities in every sphere of public policy including recreation provision, resource and land management, as well as environmental justice issues.

The questionnaire should take 20-30 minutes to complete as most of the questions only require you to circle your response. The information you provide will be kept confidential. All questionnaires have been numbered for mailing purposes only. Your name will never be placed on the questionnaire. To ensure anonymity, personal information will be coded and stored in a locked office, to which only the investigators have access. Normally, information is retained for a period of five years post publication, after which it will be destroyed. Because your participation in this study is voluntary, you may decline to continue or withdraw from this study without explanation or consequence. Finally, if you wish to speak with someone who is not involved with this study, please call Dr. Wendy Rodgers, Chair, Faculty of Physical Education and Recreation Ethics Committee, University of Alberta, (780) 492-5910.

Enclosed are a questionnaire, and a stamped, self-addressed envelope. Please return your completed questionnaire in the stamped, self-addressed envelope within 10 days after you received it. If you have any questions concerning this study, please contact either myself or one of the following people:

Gordon J. Walker, Ph.D.
Faculty of Physical Education & Recreation
University of Alberta
(780) 492-0581, gordon.walker@ualberta.ca

Guy S. Swinnerton, Ph.D.
Faculty of Physical Education & Recreation
University of Alberta
(780) 492-5602, guy.swinnerton@ualberta.ca

We wish to thank you for your time on, and assistance with, this study.

Jinyang Deng
Encl.

邀请与知会信 (Cover and Information Letter - Chinese version)

尊敬的______：

几天前，我们打电话给您，请您参与一项阿尔佰塔大学博士研究项目，该项目题为“国家公园态度，环境态度，及休闲态度：加拿大华人与英裔加拿大人之比较。”再次谢谢您乐意参与本项研究。

本研究旨在了解加拿大华人与英裔加拿大人在国家公园态度，环境态度，休闲态度等方面所存在的异同。交叉文化研究已越来越重要，这是由于：(1) 加拿大比以前任何时期更加族群多样化，及(2) 加拿大不断增加的族群多样化给公共政策如娱乐供给，资源和土地管理，及环境公正等方面带来挑战和机遇。

本调查表将花费您20 到30分钟时间来完成。调查表中所列问题大都只需画圈即可。您所提供的信息将保密。为邮寄方便，所有的调查表都加以编号。您的姓名将不会出现在调查表中。为确保匿名，个人资料将进行编码并妥善存放在一间办公室内，只有研究者本人才能接近。通常，所有相关资料将保留至研究发表之后5年，然后销毁。您参与本项研究是出于自愿，您可以不愿继续或要求退出这项研究而不需要任何解释或负有任何后果。如果您想和没有涉及本研究的有关人士交谈，请电话联系阿尔佰塔大学体育与娱乐学院伦理委员会主席文迪•偌加博士 (Dr. Wendy Rodgers), 电话号码：780-492-5910。

随信附寄的包括两份意愿表，一份调查表，及一个邮资已付，写好地址的信封。请将填好的调查表，连同一份意愿表一起用所附的已贴好邮票，写好地址的信封寄回给我们。

关于本项研究，如果您有任何疑问，请与我本人，或下面两人中的任何一位联系：

戈登•沃克博士 (Dr. Gordon J. Walker)
阿尔佰塔大学
体育与娱乐学院
电话号码：(780) 492-0581
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十分感谢您的时间和帮助！

祝好！

邓金阳

(日期)

附件

Informed Consent Form

Title of Project: Attitudes toward National Parks, the Environment, and Leisure: A Comparison between Chinese in Canada and Anglo-Canadians

Investigators: Jinyang Deng (Doctoral candidate), Gordon J. Walker, Ph.D., and Guy S. Swinnerton, Ph.D.

Affiliation: Faculty of Physical Education and Recreation, University of Alberta

Telephones: (780) 424-3629, (780) 492-0581, (780) 492-5602

E-mails: jinyang@ualberta.ca, gordon.walker@ualberta.ca, guy.swinnerton@ualberta.ca

To be completed by the research participant

Do you understand that you have been asked to be in a research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you are free to refuse to participate in this study?	Yes	No
Has the issue of confidentiality been explained to you? Do you understand who will have access to the information?	Yes	No

I agree to take part in this study.

Signature of Research Participant	Signature of Witness
Printed Name	Printed Name
Date	Date

Please keep one copy of this informed consent form for your records and return the other completed informed consent form, along with your completed questionnaire, in the stamped, self-addressed envelope provided.

意愿表 (Informed Consent Form-Chinese Version)

项目名称：加拿大华人与英裔加拿大人对国家公园，环境，及休闲所持态度之比较

研究人员：邓金阳（博士候选人），戈登・沃克博士（Dr. Gordon J. Walker），盖伊・史文莱登博士（Dr. Guy S. Swinnerton）

所在单位：阿尔伯塔大学体育与娱乐学院

电话号码：(780) 424-3629，(780) 492-0581，(780) 492-5602

电子信箱：jinyang@ualberta.ca, gordon.walker@ualberta.ca, guy.swinnerton@ualberta.ca

以下由研究参与者完成：

您知道您被要求参与一项研究吗？	是	否
您有机会就本研究提问和讨论吗？	是	否
您知道您可以不受限制的拒绝参与，或可毫无后果的在任何时候中途退出，并一经请求，您的资料就会从研究中除去吗？	是	否
有关保密事宜已经对您作过解释吗？您知道谁能接近参与者个人资料吗？	是	否

我同意参加这项研究。

研究参与者签名	日期	见证人
印刷体署名		印刷体署名

请您自己保留一份意愿表, 将另一份添好的意愿表连同添好的调查表用所附的信封一起寄回给我们。

Follow-up Letter

Jinyang Deng
Faculty of Physical Education and Recreation
University of Alberta
Edmonton, AB, Canada, T6G 2H9
Email: jinyang@ualberta.ca
Tel: (780) 424-3629

Date

Dear

About one month ago I sent a questionnaire to you that asked about your attitudes toward national parks, the environment and leisure. To the best of our knowledge, it's not yet been returned.

We are writing again because of the importance that your questionnaire has for helping to get accurate results. It's only by hearing from nearly everyone in the sample that we can be sure that the results are truly representative.

A comment on our survey procedures. A questionnaire identification number is printed on the front cover of the questionnaire so that we can check your name off of the mailing list when it is returned. The list of names is then destroyed so that individual names can never be connected to the results in any way. Protecting the confidentiality of people's answers is very important to us, as well as the University.

We hope that you will fill out and return the questionnaire soon, but if for any reason you prefer not to answer it, please let us know by returning a note or blank questionnaire in the enclosed stamped envelope. If you have returned the filled questionnaire prior to receiving this letter, please disregard this questionnaire. Thank you.

Sincerely,

Jinyang Deng

Doctoral Candidate

Encl.

Follow-up Letter (Chinese version)

Jinyang Deng
Faculty of Physical Education and Recreation
University of Alberta
Edmonton, AB, Canada, T6G 2H9
Email: jinyang@ualberta.ca
Tel: (780) 424-3629

尊敬的

约一个月前，我给您寄来了一份调查表，请您就国家公园，环境及休闲等问题表达您的看法。到目前为止，我还没有收到您寄回的调查表。

我再次写信给您，是因为您的参与有助于我们获得准确的结果。只有几乎所有的参与者都寄回填好的调查表，我们才能确保调查结果具有真实的代表性。

这次寄来的调查表与上次同样。该表封面右下角有该表的编号，编号的目的是方便邮寄和核实，一旦该表邮回，您的名字就会从所列的邮寄表中删除。名单表也将全部删除，这样，调查结果无论如何也不会与参与者挂钩。我们及阿尔伯塔大学有责任对您所提供的信息保密。

如果您能尽早填好并寄回该表，我们将不胜感激！不过，如果因为任何原因您不想填写这份调查表，也请您用所附的信封寄回这份空表或一个信条，以告知于我。在收到这封信前，如果您的调查表已经寄出，这封信及附寄的调查表，您可以置之不理。谢谢！

再次祝您及您全家新年好运，并祝过年好！

此致

敬礼！

邓金阳

(日期)

附件

University of Alberta

Study on

Attitudes toward National Parks, the Environment, and Leisure

Mail Questionnaire (English version)

2002

QUESTIONNAIRE No.

ATTITUDES TOWARD NATIONAL PARKS, THE ENVIRONMENT, AND LEISURE: A COMPARISON BETWEEN CHINESE IN CANADA AND ANGLO-CANADIANS

INSTRUCTIONS

There are four sections to this questionnaire, including attitudes toward national parks, attitudes toward the environment, attitudes toward leisure, and background information. Please answer the following questions by circling the number next to the most appropriate answer or by writing your answer in the space provided. After you are done, please enclose the questionnaire with one copy of the informed consent form in the envelope provided, and mail both back to us. Thank you very much.

SECTION 1

1. Measurement Scale of Attitudes toward Roles and Functions of National Parks

Listed below are statements about roles and functions of national parks. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

1. National parks are places for protecting the natural environment and wildlife	1	2	3	4	5
2. National parks are places for learning about nature	1	2	3	4	5
3. National parks are places for people's enjoyment	1	2	3	4	5
4. National parks are places for scientific research and monitoring	1	2	3	4	5
5. National parks are places for recreational activities	1	2	3	4	5
6. National parks are places for protecting cultural and historical heritage	1	2	3	4	5
7. National parks are areas to protect endangered species of flora, fauna, and wildlife habitats	1	2	3	4	5

Strongly Disagree	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

8. National parks are tourist destinations	1	2	3	4	5
9. Protecting the natural environment and wildlife should be the first priority of national parks	1	2	3	4	5
10. National parks are places for the commercial development of natural resources (such as: oil, gas, timber, minerals)	1	2	3	4	5
11. National parks help to promote a sense of Canadian identity	1	2	3	4	5
12. National parks are reserves of natural resources for future use	1	2	3	4	5
13. National parks provide economic benefits	1	2	3	4	5
14. National parks are places to be protected for the enjoyment of future generations	1	2	3	4	5
15. National parks are places for all living things to exist	1	2	3	4	5
16. National parks help to reduce global warming	1	2	3	4	5
17. National parks function as places for spiritual fulfillment	1	2	3	4	5
18. National parks function to preserve biological diversity	1	2	3	4	5
19. National parks are places to protect the scenic beauty of nature	1	2	3	4	5
20. National parks are places for socializing	1	2	3	4	5

2. Measurement Scale of Attitudes toward Appropriate Use within National Parks

Listed below are selected activities, facilities, and services that are provided in Canadian national parks. Please use the following scale to indicate how environmentally appropriate or inappropriate each is by circling your response.

Highly Inappropriate	**Moderately Inappropriate**	**Neutral**	**Moderately Appropriate**	**Highly Appropriate**
1	**2**	**3**	**4**	**5**

Accommodation facilities					
1. Tents/campgrounds	1	2	3	4	5
2. Hotel accommodation	1	2	3	4	5
3. Residency/permanent homes	1	2	3	4	5
Sport and recreation facilities					
4. Children's playgrounds	1	2	3	4	5
5. Sports fields	1	2	3	4	5
6. Golf courses	1	2	3	4	5
7. Skiing areas	1	2	3	4	5
Service Facilities					
8. Grocery stores and laundromats	1	2	3	4	5
9. Restaurants or lounges	1	2	3	4	5
10. Gas/service stations	1	2	3	4	5
11. Gift shops	1	2	3	4	5
12. Visitor information/interpretive centres	1	2	3	4	5
13. School/educational services	1	2	3	4	5
14. Hospital/medical services	1	2	3	4	5
Outdoor activities					
15. Rock-climbing/mountaineering	1	2	3	4	5
16. Sightseeing by car	1	2	3	4	5
17. Hiking/backpacking	1	2	3	4	5

Highly Inappropriate	Moderately Inappropriate	Neutral	Moderately Appropriate	Highly Appropriate
1	2	3	4	5

18. Power boating	1	2	3	4	5
19. Mountain biking	1	2	3	4	5
20. Jogging/running/walking	1	2	3	4	5
21. Wildlife watching	1	2	3	4	5
22. Casinos	1	2	3	4	5
23. Non-motorized boating/canoeing/kayaking	1	2	3	4	5
24. Picnicking/Barbecuing	1	2	3	4	5
25. Hunting	1	2	3	4	5
26. Taking pictures	1	2	3	4	5
27. Gathering natural edible products (fruits, berries,mushrooms, fern fiddleheads, etc)	1	2	3	4	5
28. Fishing	1	2	3	4	5

3. Measurement Scale of Attitudes toward National Park Policy

Listed below are statements about national park policy. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

1. Parks Canada should limit the numbers of visitorsif the natural environment and wildlife are threatened	1	2	3	4	5
2. Parks Canada is too lenient in allowing recreation activities that harm the environment	1	2	3	4	5

Strongly Disagree	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

3. Parks Canada is tending to unnecessarily restrictpublic enjoyment and use of parks in order to promote greater preservation of the park environment 1 2 3 4 5

4. Parks Canada is becoming too concerned with protecting the natural environment and wildlife 1 2 3 4 5

5. Parks Canada should be willing to compromise on protecting the park environment in order forvisitors to experience as wide range of outdoor recreation activities as possible within national parks 1 2 3 4 5

6. Parks Canada does not pay sufficient attention to the outdoor recreation needs and preferences of park visitors 1 2 3 4 5

7. Parks Canada should limit recreational/tourism activities, facilities, and services if the scenic beauty of the parks is threatened 1 2 3 4 5

8. Neither the provision of a wide variety of visitor activities nor commercial activity threatens the natural environment and wildlife of national parks 1 2 3 4 5

9. Parks Canada should use protecting the natural environment and wildlife as the primary criterion for all resource andvisitor management decisions within national parks 1 2 3 4 5

10. Parks Canada should phase out inappropriate recreational uses within national parks 1 2 3 4 5

SECTION 2

1. Measurement Scale of Environmental Values

The following is a list of values that are believed to have a bearing on the environment. Please use the following scale to indicate how important or unimportant each statement is to you by circling your response.

Not at all Important	Slightly Important	Moderately Important	Quite Important	Extremely Important
1	2	3	4	5

1. Unity with nature	1	2	3	4	5
2. Protecting the environment	1	2	3	4	5
3. Preventing pollution	1	2	3	4	5
4. Respecting the Earth	1	2	3	4	5
5. A world at peace	1	2	3	4	5
6. Equality	1	2	3	4	5
7. Social justice	1	2	3	4	5
8. Helpful	1	2	3	4	5
9. A world of beauty	1	2	3	4	5
10. Sense of belonging	1	2	3	4	5

2. Measurement Scale of Environmental Attitudes

Listed below are statements about the relationship between humans and the environment. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

1. We are approaching the limit of the number of people the earth can support	1	2	3	4	5
2. Humans have the right to modify the natural environment to suit their needs	1	2	3	4	5
3. When humans interfere with nature it often produces disastrous consequences	1	2	3	4	5
4. Human ingenuity will insure that we do NOT make the earth unlivable	1	2	3	4	5
5. Humans are severely abusing the environment	1	2	3	4	5

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

6. The earth has plenty of natural resources if we just learn how to develop them	1	2	3	4	5
7. Plants and animals have as much right as humans to exist	1	2	3	4	5
8. The balance-of-nature is strong enough to cope with the impacts of modern industrial nations	1	2	3	4	5
9. Despite our special abilities humans are still subject to the laws of nature	1	2	3	4	5
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated	1	2	3	4	5
11. The earth is like a spaceship with very limited room and resources	1	2	3	4	5
12. Humans were meant to rule over the rest of nature	1	2	3	4	5
13. The balance-of-nature is very delicate and easily upset	1	2	3	4	5
14. Humans will eventually learn enough about how nature works to be able to control it	1	2	3	4	5
15. If things continue on their present course, we will soon experience a major ecological catastrophe	1	2	3	4	5

SECTION 3

Measurement Scale of Leisure Attitudes

Listed below are statements about your attitudes toward leisure. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

1. Leisure pursuits are beneficial to individuals and society	1	2	3	4	5
2. Leisure pursuits contribute to one's health	1	2	3	4	5
3. Leisure pursuits increase one's happiness	1	2	3	4	5
4. Leisure increases one's work productivity	1	2	3	4	5
5. Leisure pursuits help to renew one's energy	1	2	3	4	5
6. Leisure pursuits can be a means for self-improvement	1	2	3	4	5
7. Leisure pursuits help individuals to relax	1	2	3	4	5
8. People need leisure pursuits	1	2	3	4	5
9. My leisure pursuits give me pleasure	1	2	3	4	5
10. My leisure pursuits are exciting	1	2	3	4	5
11. I feel guilty about enjoying myself	1	2	3	4	5
12. I can be myself during my leisure	1	2	3	4	5
13. My leisure pursuits are interesting	1	2	3	4	5
14. My leisure pursuits are refreshing	1	2	3	4	5
15. I like my leisure pursuits	1	2	3	4	5
16. My leisure pursuits absorb or get my full attention	1	2	3	4	5
17. I buy goods and equipment to use in my leisure pursuits as my income allows	1	2	3	4	5
18. I spend considerable time and effort to be more competent in my leisure pursuits	1	2	3	4	5

Strongly Disagree	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

19. Given a choice I would live in an environment or city which provides for leisure	1	2	3	4	5
20. I would attend a seminar or a class to be able to do leisure pursuits better	1	2	3	4	5
21. I support the idea of increasing my free time to engage in leisure pursuits	1	2	3	4	5
22. I engage in leisure pursuits even when I am busy	1	2	3	4	5
23. I would spend time in education and preparation for leisure pursuits	1	2	3	4	5
24. I give my leisure high priority among other pursuits	1	2	3	4	5

SECTION 4

Background Information

1. Sex Female _____ Male _____

2. How old are you today? (*Please circle the single best answer*)

18-29_____ 30-39_____ 40-49 _____ 50-59_____ 60-69_____ 70 and over_____

3. Which best describes your present situation? Single _____Married/partner _____

4. What is the highest level of education you have completed? (*Please circle the single best answer*)

Less than high school degree ____ High school degree or equivalent ____

Undergraduate or post-secondary degree ____ Graduate school degree ____

5. In which country were you born? ____________________
(Name of country)

6. What is your household income?

Under $24,999 ______ $25,000 to $49,999 ______ $50,000 to $74,999 ______

$75,000 to $99,999 ______ over $100,000 ______

7. Have you visited any national park(s) in Canada during the past 12 months?

Yes ______ No ______

If yes, how many times have you visited national park(s) in Canada during the last 12 months? ____

Please name up to three of these national parks:

__________________ __________________ ________________________

8. Do you have any comments concerning this study, national parks, the environment, or leisure, that you would like to add?

____

____

____

____

____

____

Thank you once again for your time and cooperation.

University of Alberta

Study on

Attitudes toward National Parks, the Environment, and Leisure

Mail Questionnaire (Chinese version in English)

2002

QUESTIONNAIRE No.

ATTITUDES TOWARD NATIONAL PARKS, THE ENVIRONMENT, AND LEISURE: A COMPARISON BETWEEN CHINESE IN CANADA AND ANGLO-CANADIANS

INSTRUCTIONS

There are five sections to this questionnaire, including acculturation measurement, attitudes toward national parks, attitudes toward the environment, attitudes toward leisure, and background information. Please answer the following questions by circling the number next to the most appropriate answer or by writing your answer in the space provided. After you are done, please enclose the questionnaire with one copy of the informed consent form in the envelope provided, and mail both back to us. Thank you very much.

SECTION 1

Measurement Scale of Chinese Acculturation

Listed below are statements about acculturation. For each one, please use the following scale to indicate how much you agree or disagree with it by circling your response.

Strongly Disagree	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

1. I was raised in a way that was Chinese	1	2	3	4	5
2. I am proud of Chinese culture	1	2	3	4	5
3. I believe that my children should read, write, and speak Chinese	1	2	3	4	5
4. I would prefer to live in a Chinese/Chinese Canadian community	1	2	3	4	5
5. I prefer to go to Chinese restaurants for friend gatherings	1	2	3	4	5
6. My friends are Chinese/Chinese Canadians	1	2	3	4	5
7. Overall, I am Chinese	1	2	3	4	5
8. Given a choice, I would prefer to go to Chinese social occasions to mainly White gatherings	1	2	3	4	5
9. When I am around White people, I am conscious of being "different"	1	2	3	4	5
10. I sometimes wish I could be White instead of being Chinese	1	2	3	4	5

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

11. I prefer to eat Chinese food at home	1	2	3	4	5
12. When one receives a gift, one should reciprocate with a gift of equal or greater value	1	2	3	4	5
13. One needs not achieve academically to make one's parents proud	1	2	3	4	5
14. One should be humble and modest	1	2	3	4	5
15. I prefer to speak Chinese	1	2	3	4	5
16. I prefer to read in Chinese	1	2	3	4	5
17. I prefer to write in Chinese	1	2	3	4	5
18. I prefer to listen to Chinese music	1	2	3	4	5
19. I will financially support (or currently do support) my parents when they are old	1	2	3	4	5
20. I am a frequent Western church goer	1	2	3	4	5
21. I celebrate Chinese holidays	1	2	3	4	5
22. I feel that my relationships with others are more important than my own accomplishments	1	2	3	4	5
23. I enjoy being unique and different from others in many respects	1	2	3	4	5
24. It is important to me to consider my friends' opinions before I act	1	2	3	4	5

SECTION 2

1. Measurement Scale of Attitudes toward Roles and Functions of National Parks

Listed below are statements about roles and functions of national parks. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

1. National parks are places for protecting the natural environment and wildlife	1	2	3	4	5
2. National parks are places for learning about nature	1	2	3	4	5
3. National parks are places for people's enjoyment	1	2	3	4	5
4. National parks are places for scientific research and monitoring	1	2	3	4	5
5. National parks are places for recreational activities	1	2	3	4	5
6. National parks are places for protecting cultural and historical heritage	1	2	3	4	5
7. National parks are areas to protect endangered species of flora, fauna, and wildlife habitats	1	2	3	4	5
8. National parks are tourist destinations	1	2	3	4	5
9. Protecting the natural environment and wildlife should be the first priority of national parks	1	2	3	4	5
10. National parks are places for the commercial development of natural resources (such as: oil, gas, timber, minerals)	1	2	3	4	5
11. National parks help to promote a sense of Canadian identity	1	2	3	4	5
12. National parks are reserves of natural resources for future use	1	2	3	4	5
13. National parks provide economic benefits	1	2	3	4	5
14. National parks are places to be protected for the enjoyment of future generations	1	2	3	4	5

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

15. National parks are places for all living things to exist	1	2	3	4	5
16. National parks help to reduce global warming	1	2	3	4	5
17. National parks function as places for spiritual fulfillment	1	2	3	4	5
18. National parks function to preserve biological diversity	1	2	3	4	5
19. National parks are places to protect the scenic beauty of nature	1	2	3	4	5
20. National parks are places for socializing	1	2	3	4	5

2. Measurement Scale of Attitudes toward Appropriate Uses within National Parks

Listed below are selected activities, facilities, and services that are provided in Canadian national parks. Please use the following scale to indicate how environmentally appropriate or inappropriate each is by circling your response.

Highly Inappropriate	Moderately Inappropriate	Neutral	Moderately Appropriate	Highly Appropriate
1	2	3	4	5

Accommodation facilities

1. Tents/campgrounds	1	2	3	4	5
2. Hotel accommodation	1	2	3	4	5
3. Residency/permanent homes	1	2	3	4	5

Sport and recreation facilities

4. Children's playgrounds	1	2	3	4	5
5. Sports fields	1	2	3	4	5
6. Golf courses	1	2	3	4	5

Highly Inappropriate 1	**Moderately Inappropriate 2**	**Neutral 3**	**Moderately Appropriate 4**	**Highly Appropriate 5**

7. Skiing areas	1	2	3	4	5
Service Facilities					
8. Grocery stores and laundromats	1	2	3	4	5
9. Restaurants or lounges	1	2	3	4	5
10. Gas/service stations	1	2	3	4	5
11. Gift shops	1	2	3	4	5
12. Visitor information/interpretive centres	1	2	3	4	5
13. School/educational services	1	2	3	4	5
14. Hospital/medical services	1	2	3	4	5
Outdoor activities					
15. Rock-climbing/mountaineering	1	2	3	4	5
16. Sightseeing by car	1	2	3	4	5
17. Hiking/backpacking	1	2	3	4	5
18. Power boating	1	2	3	4	5
19. Mountain biking	1	2	3	4	5
20. Jogging/running/walking	1	2	3	4	5
21. Wildlife watching	1	2	3	4	5
22. Casinos	1	2	3	4	5
23. Non-motorized boating/canoeing/kayaking	1	2	3	4	5
24. Picnicking/Barbecuing	1	2	3	4	5
25. Hunting	1	2	3	4	5
26. Taking pictures	1	2	3	4	5

Highly Inappropriate 1	Moderately Inappropriate 2	Neutral 3	Moderately Appropriate 4	Highly Appropriate 5

27. Gathering natural edible products (fruits, berries,mushrooms, fern fiddleheads, etc)	1	2	3	4	5
28. Fishing	1	2	3	4	5

3. Measurement Scale of Attitudes toward National Park Policy

Listed below are statements about national park policy. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree 1	Mildly Disagree 2	Neutral 3	Mildly Agree 4	Strongly Agree 5

1. Parks Canada should limit the numbers of visitorsif the natural environment and wildlife are threatened	1	2	3	4	5
2. Parks Canada is too lenient in allowing recreation activities that harm the environment	1	2	3	4	5
3. Parks Canada is tending to unnecessarily restrictpublic enjoyment and use of parks in order to promote greater preservation of the park environment	1	2	3	4	5
4. Parks Canada is becoming too concerned with protecting the natural environment and wildlife	1	2	3	4	5
5. Parks Canada should be willing to compromise on protecting the park environment in order forvisitors to experience as wide range of outdoor recreation activities as possible within national parks	1	2	3	4	5
6. Parks Canada does not pay sufficient attention to the outdoor recreation needs and preferences of park visitors	1	2	3	4	5
7. Parks Canada should limit recreational/tourism activities, facilities, and services if the scenic beauty of the parks is threatened	1	2	3	4	5

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

8. Neither the provision of a wide variety of visitor activities nor commercial activity threatens the natural environment and wildlife of national parks	1	2	3	4	5
9. Parks Canada should use protecting the natural environment and wildlife as the primary criterion for all resource andvisitor management decisions within national parks	1	2	3	4	5
10. Parks Canada should phase out inappropriate recreational uses within national parks	1	2	3	4	5

SECTION 3

1. Measurement Scale of Environmental Values

The following is a list of values that are believed to have a bearing on the environment. Please use the following scale to indicate how important or unimportant each statement is to you by circling your response.

Not at all Important	Slightly Important	Moderately Important	Quite Important	Extremely Important
1	2	3	4	5

1. Unity with nature	1	2	3	4	5
2. Protecting the environment	1	2	3	4	5
3. Preventing pollution	1	2	3	4	5
4. Respecting the Earth	1	2	3	4	5
5. A world at peace	1	2	3	4	5
6. Equality	1	2	3	4	5
7. Social justice	1	2	3	4	5
8. Helpful	1	2	3	4	5
9. A world of beauty	1	2	3	4	5
10. Sense of belonging	1	2	3	4	5

2. Measurement Scale of Environmental Attitudes

Listed below are statements about the relationship between humans and the environment. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

1. We are approaching the limit of the number of people the earth can support	1	2	3	4	5
2. Humans have the right to modify the natural environment to suit their needs	1	2	3	4	5
3. When humans interfere with nature it often produces disastrous consequences	1	2	3	4	5
4. Human ingenuity will insure that we do NOT make the earth unlivable	1	2	3	4	5
5. Humans are severely abusing the environment	1	2	3	4	5
6. The earth has plenty of natural resources if we just learn how to develop them	1	2	3	4	5
7. Plants and animals have as much right as humans to exist	1	2	3	4	5
8. The balance-of-nature is strong enough to cope with the impacts of modern industrial nations	1	2	3	4	5
9. Despite our special abilities humans are still subject to the laws of nature	1	2	3	4	5
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated	1	2	3	4	5
11. The earth is like a spaceship with very limited room and resources	1	2	3	4	5
12. Humans were meant to rule over the rest of nature	1	2	3	4	5
13. The balance-of-nature is very delicate and easily upset	1	2	3	4	5

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

14. Humans will eventually learn enough about how nature works to be able to control it	1	2	3	4	5
15. If things continue on their present course, we will soon experience a major ecological catastrophe	1	2	3	4	5

SECTION 4

Measurement Scale of Leisure Attitudes

Listed below are statements about your attitudes toward leisure. Please use the following scale to indicate how much you agree or disagree with each statement by circling your response.

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

1. Leisure pursuits are beneficial to individuals and society	1	2	3	4	5
2. Leisure pursuits contribute to one's health	1	2	3	4	5
3. Leisure pursuits increase one's happiness	1	2	3	4	5
4. Leisure increases one's work productivity	1	2	3	4	5
5. Leisure pursuits help to renew one's energy	1	2	3	4	5
6. Leisure pursuits can be a means for self-improvement	1	2	3	4	5
7. Leisure pursuits help individuals to relax	1	2	3	4	5
8. People need leisure pursuits	1	2	3	4	5
9. My leisure pursuits give me pleasure	1	2	3	4	5
10. My leisure pursuits are exciting	1	2	3	4	5
11. I feel guilty about enjoying myself	1	2	3	4	5
12. I can be myself during my leisure	1	2	3	4	5

Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree
1	2	3	4	5

13. My leisure pursuits are interesting	1	2	3	4	5
14. My leisure pursuits are refreshing	1	2	3	4	5
15. I like my leisure pursuits	1	2	3	4	5
16. My leisure pursuits absorb or get my full attention	1	2	3	4	5
17. I buy goods and equipment to use in my leisure pursuits as my income allows	1	2	3	4	5
18. I spend considerable time and effort to be more competent in my leisure pursuits	1	2	3	4	5
19. Given a choice I would live in an environment or city which provides for leisure	1	2	3	4	5
20. I would attend a seminar or a class to be able to do leisure pursuits better	1	2	3	4	5
21. I support the idea of increasing my free time to engage in leisure pursuits	1	2	3	4	5
22. I engage in leisure pursuits even when I am busy	1	2	3	4	5
23. I would spend time in education and preparation for leisure pursuits	1	2	3	4	5
24. I give my leisure high priority among other pursuits	1	2	3	4	5

SECTION 5

Background Information

1. Sex Female ______ Male ______

2. How old are you today? (*Please circle the single best answer*)

18-29_____ 30-39_____ 40-49 _____ 50-59_____ 60-69_____ 70 and over_____

3. Which best describes your present situation? Single _____ Married/partner _____

4. What is the highest level of education you have completed? (*Please circle the single best answer*)

Less than high school degree ____ High school degree or equivalent ____
Undergraduate or post-secondary degree ____ Graduate school degree ____

5. In which country were you born? ____________________
(Name of country)

6. For how many years have you lived in Canada? ______________
(number of years)

7. To which generation do you belong?

First generation _____ Second generation _____ Third generation or greater _____

8. Which ethnic or cultural group do you belong to?

Chinese ______ Chinese Canadian ________ Canadian ________

9. What is your household income?

Under $24,999 ______ $25,000 to $49,999 _______ $50,000 to $74,999 ______
$75,000 to $99,999 ______ over $100,000 ______

10. Have you visited any national park(s) in Canada during the past 12 months?

Yes _____ No _____

If yes, how many times have you visited national park(s) in Canada during the last 12 months? ____

Please name up to three of these national parks:

___________________ ___________________ ___________________

11. Do you have any comments concerning this study, national parks, the environment, or leisure, that you would like to add?

____
____
____
____
____

Thank you once again for your time and cooperation.

阿尔佰塔大学

国家公园态度，环境态度，及休闲态度研究

抽样调查表 **(Chinese version in Chinese)**

2002

问卷号：

□□□

加拿大华人与英裔加拿大人对国家公园，环境，及休闲所持态度之比较

说明

本表有五个部份，包括文化融合衡量，国家公园态度衡量，环境态度衡量，休闲态度衡量，及参与者基本情况等。请回答下列问题，圈上能表示最合适的答案的数字或在空栏处写出您的答案。请您添好后，将该调查表连同一份添好的意愿表一起寄回给我们。非常感谢您的参与和合作。

第一部分　文化融合衡量

下列是关于文化融合的一些陈述。对每项陈述，请使用下述衡量标准指出您在多大程度上同意或不同意该项陈述，并在您所选的数字上画圈。

很不同意	较不同意	中立	较同意	很同意
1	2	3	4	5

1. 我是按照中国人的生活方式成长的	1	2	3	4	5
2. 我对中国文化很感自豪	1	2	3	4	5
3. 我认为我的孩子应会读，写，和说中文	1	2	3	4	5
4. 我偏好住在华人/加籍华人为主的社区里	1	2	3	4	5
5. 我偏好到华人餐馆参加朋友聚会	1	2	3	4	5
6. 我的加拿大朋友大多是华人/加籍华人	1	2	3	4	5
7. 总的来说，我是华人	1	2	3	4	5
8. 如果让我选择，比之于去白人为主的聚会，我更愿去华人社交场合	1	2	3	4	5
9. 当我置身于白人周围，我意识到我的“不同”	1	2	3	4	5
10. 我有时希望我是白人而不是华人	1	2	3	4	5
11. 我偏好在家吃中国餐	1	2	3	4	5
12. 一个人接受礼物，他/她应该用同等或更贵重的礼物回报对方	1	2	3	4	5
13. 一个人不必为光宗耀祖而学有所成	1	2	3	4	5
14. 人应该起谦虚朴素	1	2	3	4	5

很不同意	较不同意	中立	较同意	很同意
1	2	3	4	5

15. 我偏好说中文 1 2 3 4 5

16. 我偏好用中文阅读 1 2 3 4 5

17. 我偏好用中文书写 1 2 3 4 5

18. 我偏好听中国音乐 1 2 3 4 5

19. 当我的父母年事已高，我将赡养他们（或目前正在这样作） 1 2 3 4 5

20. 我经常去西人教堂 1 2 3 4 5

21. 我过中国节假日 1 2 3 4 5

22. 我觉得我和其他人间的关系比我个人的成就更为重要 1 2 3 4 5

23. 在很多方面我喜欢独特和与众不同 1 2 3 4 5

24. 在我决定干什么事之前，考虑我朋友的意见对我来说是很重要的 1 2 3 4 5

第二部分 国家公园态度衡量

1. 国家公园作用及功能衡量

下面所列的是关于国家公园作用和功能一些陈述。对每项陈述，请使用下述衡量标准指出您在多大程度上同意或不同意该项陈述，并在您所选的数字上画圈。

很不同意	较不同意	中立	较同意	很同意
1	2	3	4	5

1. 国家公园是保护自然环境和野生动物的地方 1 2 3 4 5

2. 国家公园是人们了解大自然的地方 1 2 3 4 5

3. 国家公园是人们享受乐趣的地方 1 2 3 4 5

4. 国家公园是科学研究和监测之地 1 2 3 4 5

5. 国家公园是开展游乐活动的地方 1 2 3 4 5

6. 国家公园是保护文化和历史遗产的地方 1 2 3 4 5

很不同意	较不同意	中立	较同意	很同意
1	2	3	4	5

7. 国家公园是保护濒危动物, 植物, 及野生动物栖息地的地方	1	2	3	4	5
8. 国家公园是旅游地	1	2	3	4	5
9. 保护自然环境和野生动物应为国家公园的首要任务	1	2	3	4	5
10. 国家公园是从事石油、天然气、矿物开采和伐木等商业开发的地方	1	2	3	4	5
11. 国家公园能提升加拿大人的国家意识	1	2	3	4	5
12. 国家公园是保护自然资源以供未来利用的保护地	1	2	3	4	5
13. 国家公园能带来经济效益	1	2	3	4	5
14. 国家公园是被保护以供后代享受的地方	1	2	3	4	5
15. 国家公园是所有生命共同生活的地方	1	2	3	4	5
16. 国家公园能缓解全球变暖	1	2	3	4	5
17. 国家公园是满足人们精神需求的地方	1	2	3	4	5
18. 国家公园能保存生物多样性	1	2	3	4	5
19. 国家公园是保护自然风景美的地方	1	2	3	4	5
20. 国家公园是人们开展社会交往的去处	1	2	3	4	5

2. 国家公园的合理利用衡量

下面列出的是加拿大国家公园所提供的一些活动，设施及服务。请使用下列衡量标准，就其对公园环境的影响程度，指出每项活动，设施及服务在多大程度上合适或不合适，并在所选的数字上画圈。

很不合适	较不合适	中立	较合适	很合适
1	**2**	**3**	**4**	**5**

接待设施					
1. 帐篷/露营地	1	2	3	4	5
2. 宾馆	1	2	3	4	5
3. 民居/永久住房	1	2	3	4	5
运动与娱乐设施					
4. 儿童游乐场	1	2	3	4	5
5. 运动场	1	2	3	4	5
6. 高尔夫球场	1	2	3	4	5
7. 滑雪区	1	2	3	4	5
服务设施					
8. 杂货店和洗衣中心	1	2	3	4	5
9. 餐馆和休息室	1	2	3	4	5
10. 加油/维修站	1	2	3	4	5
11. 纪念品商店	1	2	3	4	5
12. 游客信息/解说中心	1	2	3	4	5
13. 学校教育服务	1	2	3	4	5
14. 医院/医疗服务	1	2	3	4	5
户外活动					
15. 攀岩/越野识途	1	2	3	4	5
16. 驱车观光	1	2	3	4	5
17. 徒步旅行/背包旅行	1	2	3	4	5
18. 动力船	1	2	3	4	5
19. 山地自行车	1	2	3	4	5
20. 慢跑/跑步/散步	1	2	3	4	5
21. 观察野生动物	1	2	3	4	5

很不合适 1	较不合适 2	中立 3	较合适 4	很合适 5

22. 赌场	1	2	3	4	5
23. 非机动船/独木舟/爱斯基摩划子	1	2	3	4	5
24. 野餐/烧烤	1	2	3	4	5
25. 打猎	1	2	3	4	5
26. 摄影	1	2	3	4	5
27. 采集自然可食物 (如野果, 草莓, 蘑菇，蕨等)	1	2	3	4	5
28. 钓鱼	1	2	3	4	5

3. 国家公园政策衡量

下列是关于国家公园政策的一些陈述。对每项陈述，请使用下述衡量标准指出您在多大程度上同意或不同意该项陈述，并在您所选的数字上画圈。

很不同意 1	较不同意 2	中立 3	较同意 4	很同意 5

1. 如果国家公园的自然环境和野生动物受到威胁，加拿大国家公园局就应限制游客人数	1	2	3	4	5
2. 加拿大国家公园局对损害公园环境的游乐活动过于宽容	1	2	3	4	5
3. 为了更好地保护国家公园的环境，加拿大国家公园局正倾向限制公众对国家公园的享受和使用	1	2	3	4	5
4. 加拿大国家公园局正变得过于关注公园自然环境及野生动物的保护	1	2	3	4	5
5. 加拿大国家公园局应愿意在保护公园环境上有所让步, 以使游客能在国家公园内体验尽可能广泛的游乐活动	1	2	3	4	5
6. 加拿大国家公园局没有足够重视公园游客的户外游乐需求和偏好	1	2	3	4	5

	很不同意 1	较不同意 2	中立 3	较同意 4	很同意 5
7. 如果国家公园美丽的自然景观受到威胁，加拿大国家公园局就应限制公园内游乐/旅游活动，设施及服务的供给	1	2	3	4	5
8. 国家公园内开展多种多样的游乐活动或商业活动不会威胁到公园对自然环境和野生动物的保护	1	2	3	4	5
9. 加拿大国家公园局应以自然环境和野生动物的保护作为国家公园资源及游客管理的主要标准	1	2	3	4	5
10. 加拿大国家公园局应逐渐摈弃国家公园内不合适的利用	1	2	3	4	5

第三部分　环境价值观和环境意识

1．环境价值观衡量

下面列出的价值观，对人们的环境态度和行为有一定影响。请使用下述衡量标准，指出每项陈述在您看来多大程度上重要或不重要，并在您所选的数字上画圈。

	根本不重要 1	稍微重要 2	较重要 3	相当重要 4	极其重要 5
1. 天人合一	1	2	3	4	5
2. 保护环境	1	2	3	4	5
3. 防止污染	1	2	3	4	5
4. 爱护地球	1	2	3	4	5
5. 世界和平	1	2	3	4	5
6. 平等	1	2	3	4	5
7. 社会公正	1	2	3	4	5
8. 乐于助人	1	2	3	4	5
9. 美的世界	1	2	3	4	5
10. 归属感	1	2	3	4	5

2. 环境态度衡量

下面列出的是关于人和环境间关系的一些陈述。对每一陈述，请使用下述衡量标准指出您在多大程度上同意或不同意该项陈述，并在您所选的数字上画圈。

很不同意	较不同意	中立	较同意	很同意
1	**2**	**3**	**4**	**5**

1. 人口数量正接近地球能支撑的极限	1	2	3	4	5
2. 人类有权改变自然环境以满足他们的需要	1	2	3	4	5
3. 人类干预自然往往产生灾难性后果	1	2	3	4	5
4. 人类智慧将确保我们不会把地球变得不能居住	1	2	3	4	5
5. 人类正在肆意破坏环境	1	2	3	4	5
6. 如果我们学会如何开发自然资源，地球的自然资源将用之不绝	1	2	3	4	5
7. 动植物和人类一样有同等的生存权	1	2	3	4	5
8. 大自然平衡足以应付现代工业国家带来的 (环境) 影响	1	2	3	4	5
9. 尽管人类有特殊的能力，但仍受制于自然规律	1	2	3	4	5
10. 所谓人类面临的“生态危机”已经被过于夸大了	1	2	3	4	5
11. 地球就象一个宇宙飞船，其空间和资源都十分有限	1	2	3	4	5
12. 人类生来就是我们这个地球的主宰者	1	2	3	4	5
13. 自然平衡十分脆弱且易被破坏	1	2	3	4	5
14. 人类终究会了解自然规律，并进而控制自然	1	2	3	4	5
15. 如果事态按目前的进程发展，不久的未来，我们将承受巨大的生态浩劫	1	2	3	4	5

第四部分 休闲态度衡量

下面所列的是关于人们对休闲的态度。请就每项陈述，请使用下述衡量标准指出您在多大程度上同意或不同意该项陈述，并在您所选的数字上画圈。

很不同意	较不同意	中立	较同意	很同意
1	**2**	**3**	**4**	**5**

1. 休闲活动有益于个人和社会	1	2	3	4	5
2. 休闲活动对人们的健康有利	1	2	3	4	5
3. 休闲活动增加人们的幸福	1	2	3	4	5
4. 休闲增强人们的工作效率	1	2	3	4	5
5. 休闲活动帮助人们恢复精力	1	2	3	4	5
6. 休闲活动是自我提高的手段	1	2	3	4	5
7. 休闲活动有助于人们放松	1	2	3	4	5
8. 人们需要休闲活动	1	2	3	4	5
9. 我的休闲活动给我快乐	1	2	3	4	5
10. 我的休闲活动令我兴奋激动	1	2	3	4	5
11. 我对自我享乐感到愧疚	1	2	3	4	5
12. 休闲过程中，我找到了自我	1	2	3	4	5
13. 我的休闲活动很有趣	1	2	3	4	5
14. 我的休闲活动使我精神焕发	1	2	3	4	5
15. 我喜欢我的休闲活动	1	2	3	4	5
16. 我的休闲活动能使我完全投入	1	2	3	4	5
17. 只要我的收入允许，我就买产品和设备用于我的休闲活动	1	2	3	4	5
18. 我花很多时间和精力使我更加能胜任我的休闲活动	1	2	3	4	5
19. 如果可能，我将选择居住在一个提供休闲的环境或城市里	1	2	3	4	5

很不同意	较不同意	中立	较同意	很同意
1	2	3	4	5

20. 为了更好的从事休闲活动，
我愿参加一个讲座或课程 1 2 3 4 5

21. 我支持增加我的自由时间
以从事休闲活动这一想法 1 2 3 4 5

22. 即使我很忙，我也从事休闲活动 1 2 3 4 5

23. 为了休闲活动，我愿花时间接受
教育及花时间做必要的准备工作 1 2 3 4 5

24. 我的休闲活动在其他活动中
占有很高的分量 1 2 3 4 5

第五部分 参与者基本情况

1. 性别 女________ 男_________

2. 年龄 (请选则一个最合适的,并标记)

18-29_____ 30-39_____ 40-49 _____ 50-59_____ 60-69_____ 70 或以上_____

3. 婚否 单身________ 已婚/伴侣__________

4. 您的最高学历(请选则一个最合适的,并标记)

低于高中_____ 高中或同等学历_____ 大学或大专______ 研究生______

5. 您出生于哪一国家？_________

6. 您在加拿大居住了多少年?_________

7. 您在加拿大属于哪一代？

第一代__________ 第二代 __________ 第三代或以上 __________

8. 您属于哪一民族或文化群体？

中国人 _______ 加拿大华人 _______ 加拿大人 ________

9. 您的家庭年收入是多少(请选则一个最合适的,并标记)?

$24,999 以下______ $25,000 至 $49,999_______ $50,000 至 $74,999______

$75,000 至 $99,999______ $100,000 以上______

10. 在过去 12 个月中您到过加拿大的国家公园吗？ 去过______ 没有________

如果您去过， 在过去 12 个月中您大概去过多少次?__________

请您列举您所去过的 3 个加拿大国家公园：

______________________; ___________________; ________________________

11. 关于本项研究，或关于国家公园，环境，及休闲，您有何见解？

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再次感谢您的时间和合作!

Appendix G. Similarity Index

In cross-cultural research, no index has been developed to compare the similarity of attitudes between two or more groups. Obviously, such an index would be definitely helpful to understand to the extent to which the two or more groups diverge or converge in an attitude measurement as a whole. To this end, a similarity index was developed to compare the similarity of attitudes toward national parks, the environment, and leisure between Anglo-Canadians and Chinese.

Given a measure with five levels for each item, 1 means the highest level of negative response, 3 means neutral, and 5 means the highest level of positive response. One approach is to compare the gap between each level of each item at a certain percentage, 10% (at the level of 90% similarity) or 5% (at the level of 95% similarity), if the differences between each pair of the five level of a given item are all within the criterion percentage, the similarity for this item is 5, if 4 pairs meet this criterion, the similarity is 4, and the like. If no such a pair exists, the similarity is 0. It is then possible to count the number of the items with different similarities (5, 4, 3, 2, 1, and 0) and then calculate the similarity index for that measure by the following formula:

$$SI = \sum_{i=1}^{p} \frac{n_i}{N} w_i \qquad w_i = 5, 4, 3, 2, 1, 0$$

Where, *SI* refer to the similarity index, *N* refer to the total number of items in a measure, n_i refer to the number of items that have a similarity w_i, *p* refer to the number of similarities. For a given measure, 5 or 4 refers to the highest similarity between two groups, 0 or 1 refers to lowest similarity.

Based on this formula, the similarity index, at the 95% level of similarity, for measures of attitudes toward national parks, the environment, and leisure are 2.95 for roles and functions, 2.32 for appropriate uses, 2.1 for policy, 3.3 for environmental values, 2.27 for environmental attitudes, and 2.96 for leisure.

Obviously, similarity index provides a straightforward comparison between different measures. For instance, the two groups shared the highest similarity about environmental values while lowest similarity about national park policy.